ALLEN&HEATH

WARNING – HIGH VOLTAGES

Power Supply Unit (PSU) work should only be carried out by qualified personnel.

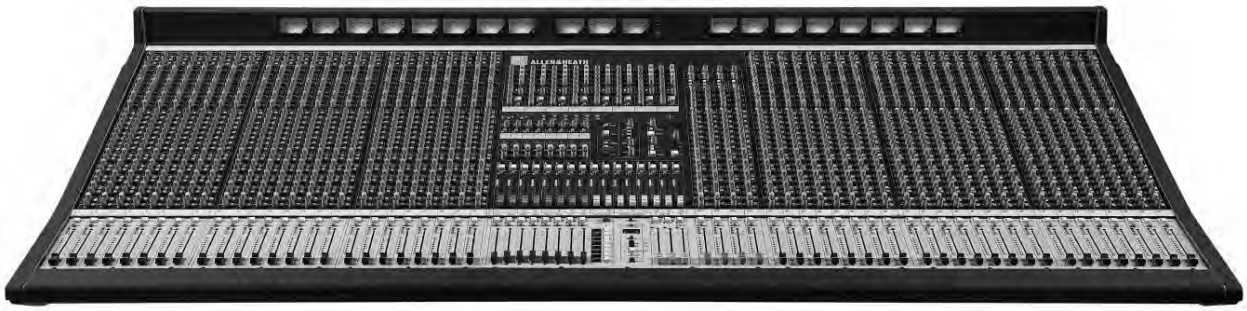
We recommend that you use an approved Allen & Heath service centre for all power supply work.

Please contact your local Allen & Heath distributor for more details.

http://www.allen-heath.com/

ALLEN&HEATH

ML5000



Dual Function Live Sound Console

SERVICE MANUAL

Publication AP3737

Introduction

This service manual provides technical information on the Allen & Heath **ML5000** audio console. Included is the technical specification, system block diagram, circuit schematics with board layouts, and a spare parts list. Information on the power supply is available in a separate publication. Only technically qualified service personnel should carry out service work on the console and its power supply.

Whilst we believe the information in this manual to be reliable we do not assume responsibility for inaccuracies. We also reserve the right to make changes in the interest of further product development.

We are able to offer further product support through our world-wide network of approved dealers and service agents. You can also access our Web site on the Internet for information on our product range and further technical support. To help us provide the most efficient service please keep a record of the console serial number, and date and place of purchase to be quoted in any communication regarding this product. The serial number is located on the rear panel.

Check out our home site for information on the company and its pedigree, our full product range and our design philosophy.

www.allen-heath.com

ML5000 Service Manual AP3737 Issue 2

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CE This product complies with the European Electromagnetic Compatibility directives 89/336/EEC & 92/31/EEC and the European Low Voltage Directives 73/23/EEC & 93/68/EEC.

This product has been tested to EN55103 Parts 1 & 2 1996 for use in Environments E1, E2, E3, and E4 to demonstrate compliance with the protection requirements in the European EMC directive 89/336/EEC. During some tests the specified performance figures of the product were affected. This is considered permissible and the product has been passed as acceptable for its intended use.

Allen & Heath has a strict policy of ensuring all products are tested to the latest safety and EMC standards. Customers requiring more information about EMC and safety issues can contact Allen & Heath.

NOTE: Any changes or modifications to the console not approved by Allen & Heath could void the compliance of the console and therefore the users authority to operate it.

ALLEN&HEATH

Manufactured in the United Kingdom by Allen & Heath

Kernick Industrial Estate, Penryn, Cornwall, TR10 9LU, UK

http://www.allen-heath.com

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Important Safety Instructions

WARNINGS - Read the following before proceeding :

ATTENTION: RISQUE DE CHOC ELECTRIQUE – NE PAS OUVRIR

Read instructions: Retain these safety and operating instructions for future reference. Adhere to all warnings printed here and on the console power unit. Follow the operating instructions printed in the user guide and the power unit user guide.

Do not remove covers: Operate the power unit with its covers correctly fitted. Refer any service work to competent technical personnel only.

Power sources: Connect the power unit to a mains power only of the type described in the User Guide and marked on the rear panel. Use the power cord with sealed mains plug appropriate for your local mains supply as provided with the console. If the provided plug does not fit into your outlet consult your service agent for assistance.

Power cord routing: Route the power cord so that it is not likely to be walked on, stretched or pinched by items placed upon or against it.

Grounding: Do not defeat the grounding and polarisation means of the power cord plug. Do not remove or tamper with the ground connection in the power cord.

WARNING: This equipment must be earthed.

Water and moisture: To reduce the risk of fire or electric shock do not expose the power unit or console to rain or moisture or use it in damp or wet conditions. Do not place containers of liquids on it which might spill into any openings.

Ventilation: Do not obstruct the ventilation slots or position the console or power unit where the air flow required for ventilation is impeded. If the console is to be operated in a flightcase ensure that it is constructed to allow adequate ventilation.

Heat and vibration: Do not locate the power unit in a place subject to excessive heat or direct sunlight as this could be a fire hazard. Locate the console and its power unit away from any equipment which produces heat or causes excessive vibration.

Servicing: Switch off the equipment and unplug the power cord immediately if it is exposed to moisture, spilled liquid, objects fallen into the openings, the power cord or plug become damaged, during lightening storms, or if smoke, odour or noise is noticed. Refer servicing to qualified technical personnel only.

Installation: Install the console in accordance with the instructions printed in the User Guide. Do not connect the output of power amplifiers directly to the console. Use audio connectors and plugs only for their intended purpose.

Important Mains Plug Wiring Instructions.

The power unit is supplied with a moulded mains plug fitted to the AC mains power lead. Follow the instructions below if the mains plug has to be replaced.

The mains lead wires are coloured in accordance with the following code:

TERMINAL		WIRE COLOUR	
		European	USA/Canada
L	LIVE	BROWN	BLACK
N	NEUTRAL	BLUE	WHITE
E	EARTH GND	GREEN & YELLOW	GREEN

The wire which is coloured Green and Yellow must be connected to the terminal in the plug which is marked with the letter E or with the Earth symbol. **This appliance must be earthed.**

The wire which is coloured Blue must be connected to the terminal in the plug which is marked with the letter N.

The wire which is coloured Brown must be connected to the terminal in the plug which is marked with the letter L.

Ensure that these colour codes are followed carefully in the event of the plug being changed.

General Precautions

Damage : To prevent damage to the controls and cosmetics avoid placing heavy objects on the control surface, scratching the surface with sharp objects, or subjecting the console to rough handling and vibration.

Environment : Protect from excessive dirt, dust, heat and vibration when operating and storing. Avoid tobacco ash, smoke, drinks spillage, and exposure to rain and moisture. If the console becomes wet, switch off and remove mains power immediately. Allow to dry out thoroughly before using again.

Radiation : To avoid induced noise and interference pickup do not operate the console close to strong sources of electromagnetic radiation such as power supplies, video monitors, lighting cables and dimmers.

Cleaning : Avoid the use of chemicals, abrasives or solvents. The control panel is best cleaned with a soft brush and dry lint-free cloth. Stubborn marks can be removed using a cloth dampened with isopropyl alcohol. Do not leave marking tape stuck to the console for long periods of time as the adhesive can degrade and leave a sticky residue. The faders, switches and potentiometers are lubricated for life. The use of electrical lubricants on these parts is not recommended. Refer to the power unit user guide for instructions on cleaning its ventilation filters.

Transporting : The console should be transported in the original packing or purpose built foam lined flightcase. Protect the control surface from damage during transit. The console is a large and heavy item. To avoid injury ensure adequate man power and precaution when lifting or moving the console.

ML5000 Key Features

The Allen & Heath **ML5000** is a large format VCA equipped dual function live sound console. It can be quickly configured for front-of-house (FOH) or stage monitor mixing. As one console suitable for both applications it is equally well suited to installation, rental and touring. It offers an IO capability and feature set that satisfies the latest trends in live sound engineering, in particular the growing number of inputs and outputs for multi-speaker house and monitor systems, demands of stereo in-ear monitoring, 3 speaker LCR imaging, advanced grouping and automation. The design ensures on-the-road durability, a clear layout for easy walk up and go operation, and no compromise audio performance.

Inputs and Outputs

- 3 Standard frame sizes: 32+4, 40+4, 48+4 (mono + stereo channels)
- 32, 40, 48 mono mic/line inputs with inserts and direct outputs
- 4 dual stereo line inputs
- 24 input sidecar to expand to a maximum 96 inputs
- Main Left, Right and Centre outputs with inserts, C configurable as the engineers monitor
- 8 Groups, 16 Auxes: Group/Aux 1-8 and Aux 9-16 with faders and inserts, Aux 1-8 with rotaries
- Matrix 1-8 with inserts and external inputs
- 2-Track monitor input and recording send
- Stereo headphones and local monitors
- Dual mic talkback input
- ClearCom compatible intercom interface

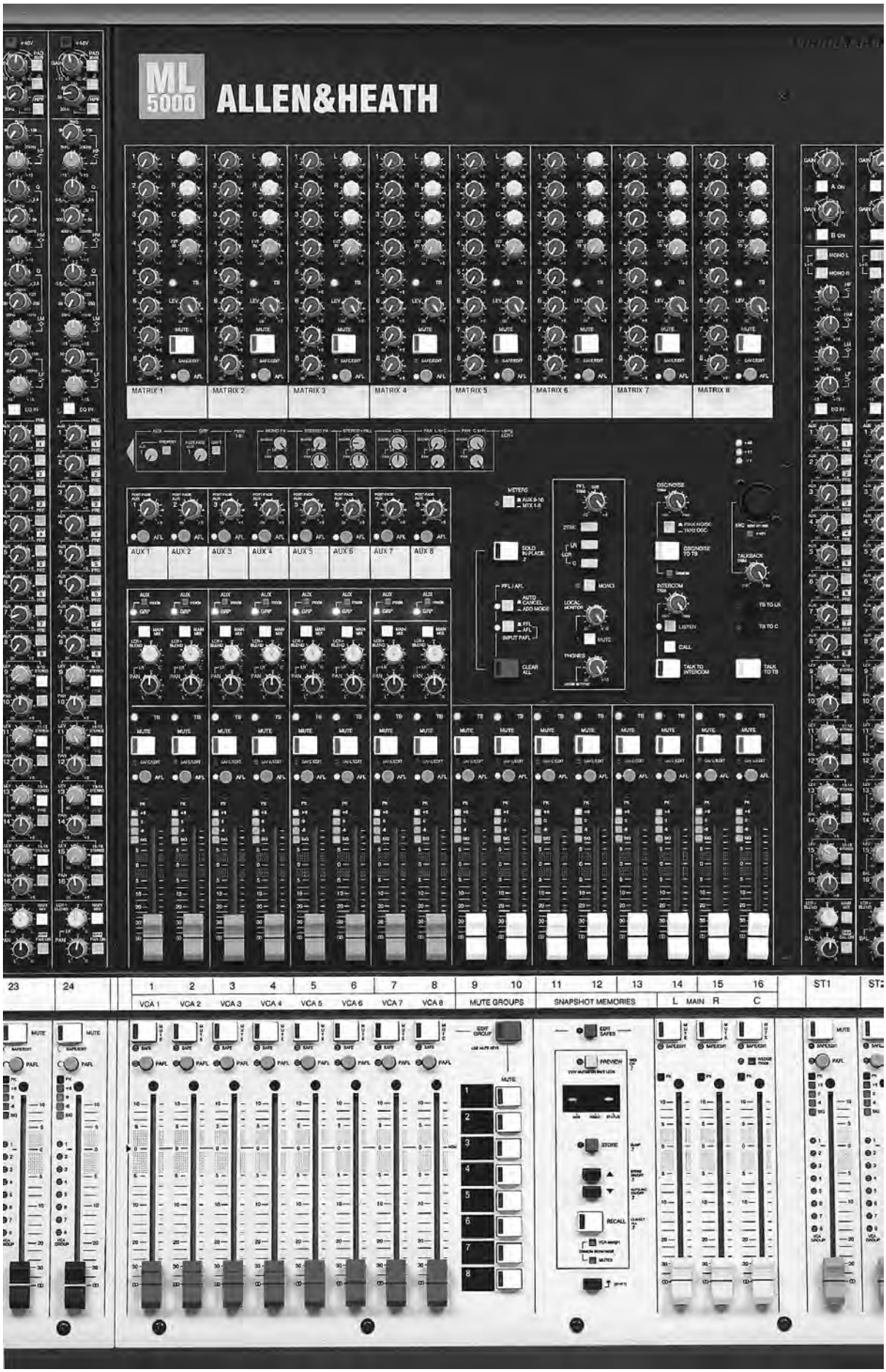
Groups and Automation

- 8 VCA groups with mutes and PAFL monitoring
- 8 audio groups with LCRplus™ subgrouping
- 8 mute groups
- 128 snapshot memories for mute and/or VCA assignment store, recall and preview
- Solo-in-place with all-clear and toggle-last
- MIDI mute on/off, snapshot recall and dump in/out control
- Channels can be made safe independently from the automation and solo-in-place

Processing and Control

- 4-Band full sweep mono EQ with fully parametric mids, 4-band fixed frequency stereo EQ
- Sweepable high pass filter
- LCRplus™ 3 speaker imaging system
- Protected mode switching to configure the console for FOH or monitor application
- Intelligent PAFL system with all-clear, PFL/in-place AFL, priority, auto-cancel/add mode…
- Assignable talkback and intercom
- 1kHz tone and pink noise generator for system line-up and testing
- Full console monitoring and extensive metering of inputs, mix busses and outputs

Front Panel Layout



Rear Panel Layout

MONO INPUT and EQ. The input preamp matches microphone or line level signals to the console. The sweepable high pass filter removes unwanted low frequency sounds below the selected frequency. The channel insert is post filter, pre EQ. A swept frequency 4 band equaliser provides shelving high and low bands with adjustable shelf frequency, and fully parametric high and low mid bands with adjustable centre frequency and Q. The filter and EQ can be independently switched in or out.

GRP/AUX SENDS. This section provides controls for the group routing and auxiliary sends. Controls 1-8 function according to the setting of the mode switches in the master section. These configure group routing switches and independent post-fade aux sends for FOH (front-of-house) application, or pre/post switchable sends for stage monitor application. Controls 9-16 can be configured as mono or stereo pre/post aux sends.

MAIN MIX SENDS. A single switch routes the channel signal to the main L, R and C outputs. The balance between the three outputs is determined by the LCRplus pan and blend controls. Pan can also be switched in or out of the group routing for stereo or mono groups.

INPUT FADERS. Includes the channel fader, mute, signal meter and PAFL monitoring. The 8 VCA group assignments are displayed. VCA and mute group editing and channel safe selection is performed using the mute switch with green safe/edit indicator below.

STEREO INPUT and EQ. The input preamp accepts two stereo sources with independent control of each. This allows selection of either or mixing together both sources. A fixed frequency 4 band equaliser provides shelving high and low bands and two bell mid bands. The EQ can be switched in or out.

GRP/AUX 1-8 MASTERS. These are the fader masters for channel sends 1-8, configurable using mode switches as fixed level groups or as variable level pre or post-fade auxes. The output can be routed to the main mix through LCRplus controls to create sub groups. Led meters display the pre-fade mix levels.

AUX 9-16 MASTERS. These are the fader masters for channel sends 9-16.

ROTARY AUX MASTERS. These are the rotary masters for channel post-fade aux sends 1-8. They provide the independent effects sends when the fader masters are configured as groups. They still function when the fader masters are configured as pre/post auxes but would not normally be required.

MAIN MIX FADERS. Provides separate master faders and mutes for the main L, R and C outputs. A mode switch configures the C output as the engineers wedge monitor feed for the stage monitor application.

MATRIX. This section provides all the controls for the 8 matrix outputs, including the source and master rotaries.

VCA GROUPS. These are the VCA group master faders, mutes and PAFL monitor switches. Channels are assigned to the groups using the edit key. The normal fader operating level is marked '0'.

MUTE GROUPS. These are the master keys that mute all channels assigned to the group. Channels are assigned using the edit key.

SNAPSHOT MEMORIES. Provides the controls to store, recall and preview the 128 onboard memories, and edit channel safes. Mute settings and/or VCA assignments can be disabled from the snapshots.

HEADPHONES / MONITOR. Provides source selection and independent control of the headphones and local monitor outputs.

SOLO-IN-PLACE. Pressed with the shift key this puts the console into SIP mode ready to solo any channel when its mute key is pressed.

PAFL CONTROL. This section controls how the intelligent PAFL system functions and provides the clear all key.

OSC/NOISE GENERATOR. Enables and selects a 1kHz tone or pink noise which can be routed to any output for line up or system testing.

INTERCOM. The console talkback mic and headphones can be interfaced to a ClearCom compatible intercom system so eliminating the need for a separate intercom headset.

TALKBACK. Pressing the talk switch routes the talkback mic to any output with its TB enable switch selected. The mic input is duplicated on the rear panel for plugging in hand held microphones.

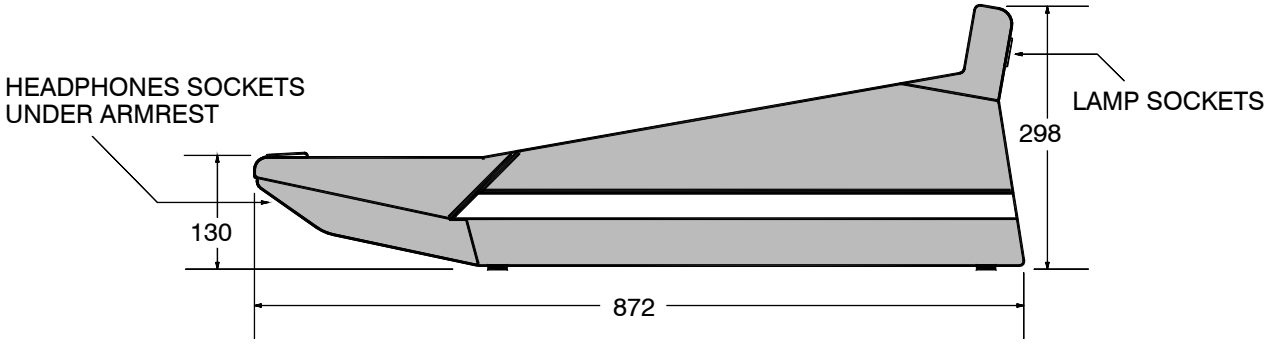
GRP/AUX 1-8 METERS. These moving coil VU meters display the grp/aux 1-8 outputs.

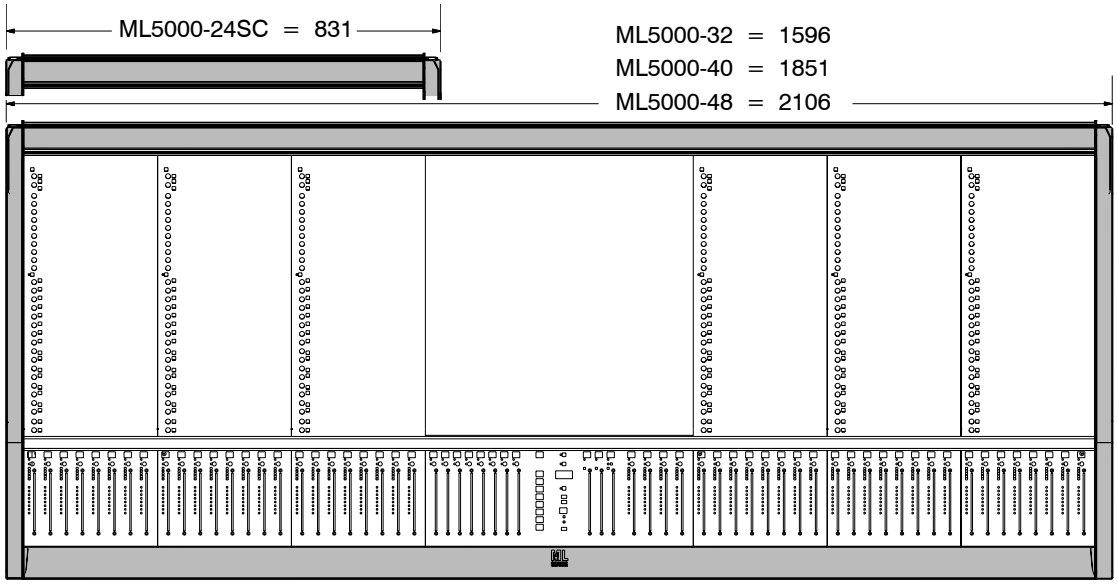
LRC/PAFL METERS. The main L,R and C outputs are simultaneously displayed on both VU and led bar meters. These switch to display any PFL or AFL when selected. The display is mono or mono + stereo depending on source. The large call lamp lights to warn when the intercom is signalled.

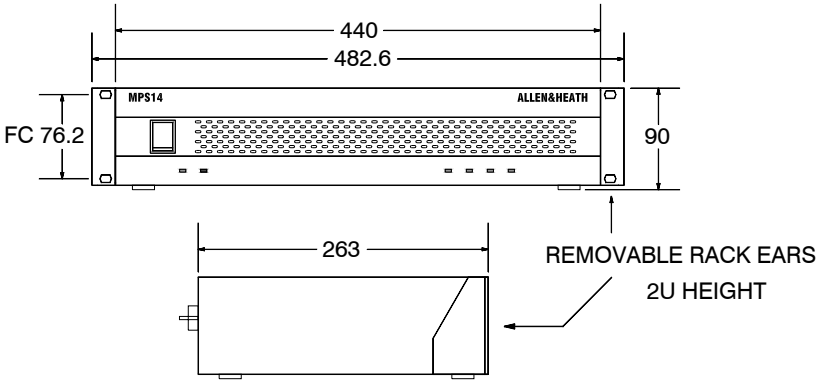
AUX 9-16 / MTX 1-8 METERS. These meters display either the aux 9-16 outputs or matrix 1-8 levels according to the setting of the meter select switch near section.

Installing the Console

Weights	32 Channel	84 kg (185 lbs)
	40 Channel	96 kg (211 lbs)
	48 Channel	110 kg (242 lbs)
	24 Channel sidecar	45 kg (95 lbs)
	MPS14 psu	6 kg (13 lbs)





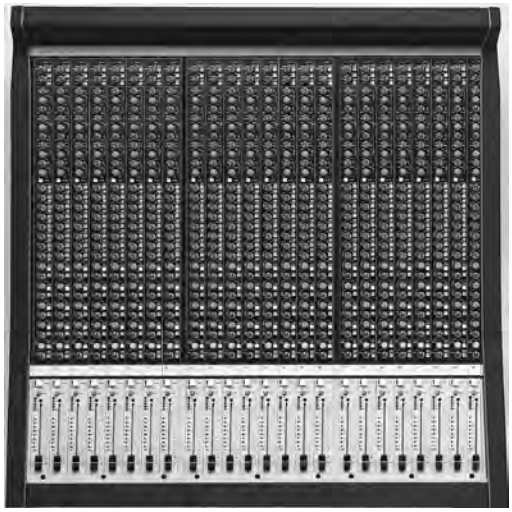


Refer to the power supply user guide for safety and installation instructions. **Heed all warnings printed in the user guide and on the power unit**.

Refer to the sidecar user guide for instructions on connecting the sidecar expander to the console.

CAUTION: Ensure adequate ventilation around the power supply unit. Do not operate it where it is subject to excessive heat, for example in direct sunlight or next to power amplifiers. Use forced air cooling such as rack fans if it is operated in a confined or hot space.

The Expander Sidecar

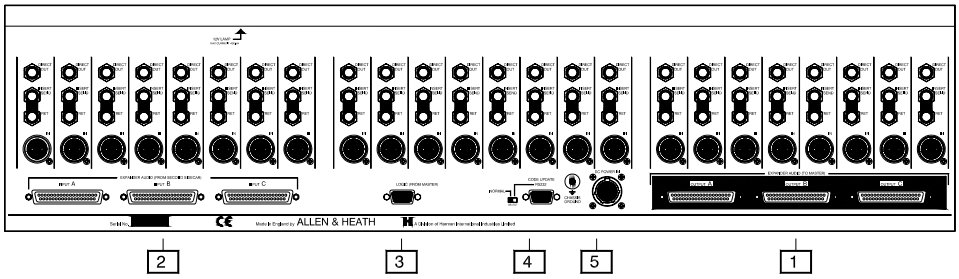


The Allen & Heath **ML5000-24SC Sidecar** is the 24 mono input channel expander for the **ML5000** console. It is free standing and does not need to be mechanically fixed to the main console. Interconnection is by means of multiway cables to link the audio signals and control logic. It is supplied with its own power supply unit independent of the console. The input channel strip is identical to the main console with all functions available. The groups and snapshots are controlled from the main console. Up to two gooseneck lamps (part AL4061) may be plugged into the rear of the meterbridge.

Note: This sidecar may be used with the **ML5000** only. It is not suitable for use with other consoles or as a stand alone console. One or two sidecars may be connected allowing a maximum 96 input channels. Do not connect more than two sidecars.

The following is supplied with each sidecar:

1x	**MPS14** Power Supply Unit with User Guide	MPS14/n
1x	Mains cord with moulded plug suitable for your local supply	n = volts
1x	DC power cable 2.8 metres long	002-583
3x	37way Audio Cables 2.8 metres long	002-617
1x	9way Logic Cable 2.8 metres long	AL4155



Connecting the Sidecar to the Console

Diagram 1 shows the cable routing for connecting the sidecars to the **ML5000**. Refer to **Diagram 2** for connecting one sidecar. Refer to **Diagram 3** for connecting two sidecars.

Connect the three audio OUTPUT connectors [1] to the main console EXPANDER INPUT using the three 37way 1 to 1 shielded cables provided. We recommend that you label the cables A, B and C to avoid them being swapped if replugged. If you are connecting a second sidecar plug its OUTPUT into the first sidecar INPUT connectors [2]. Plug the LOGIC connector [3] into the main console LOGIC connector 1 for one sidecar, or 1 and 2 for two sidecars. Plug the power supply DC cable into connector [5].

Note: To maintain correct channel assignment do not reverse the interconnecting cables. Make sure the cable plug locking screws are correctly tightened.

Turning the Console and Sidecars On and Off

Make sure the DC power cables and audio and logic interconnecting cables are correctly plugged in and locked. Turn all power supplies on or off together. Alternatively, turn the sidecar supplies on first followed by the main console, and turn the console off first followed by the sidecars. Do not turn off any supply during normal console operation.

Note: For normal console operation make sure the rear panel RS232 switch [4] is set to its NORMAL position. It will not function correctly if left in its RS232 position.

Diagram 1

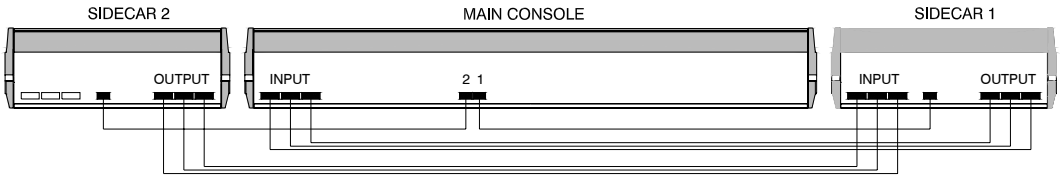


Diagram 2

CONNECTING ONE SIDECAR

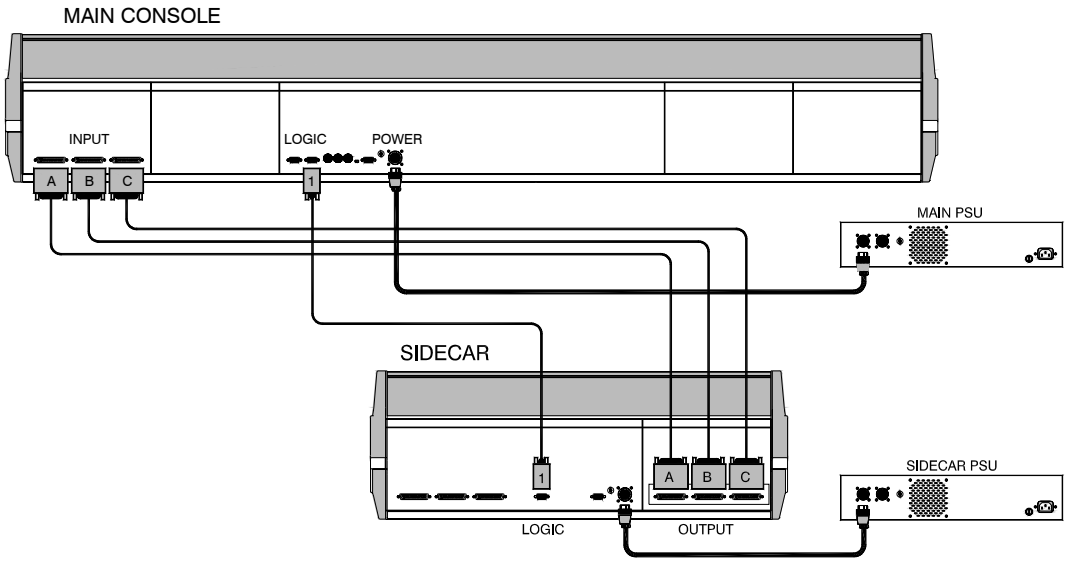
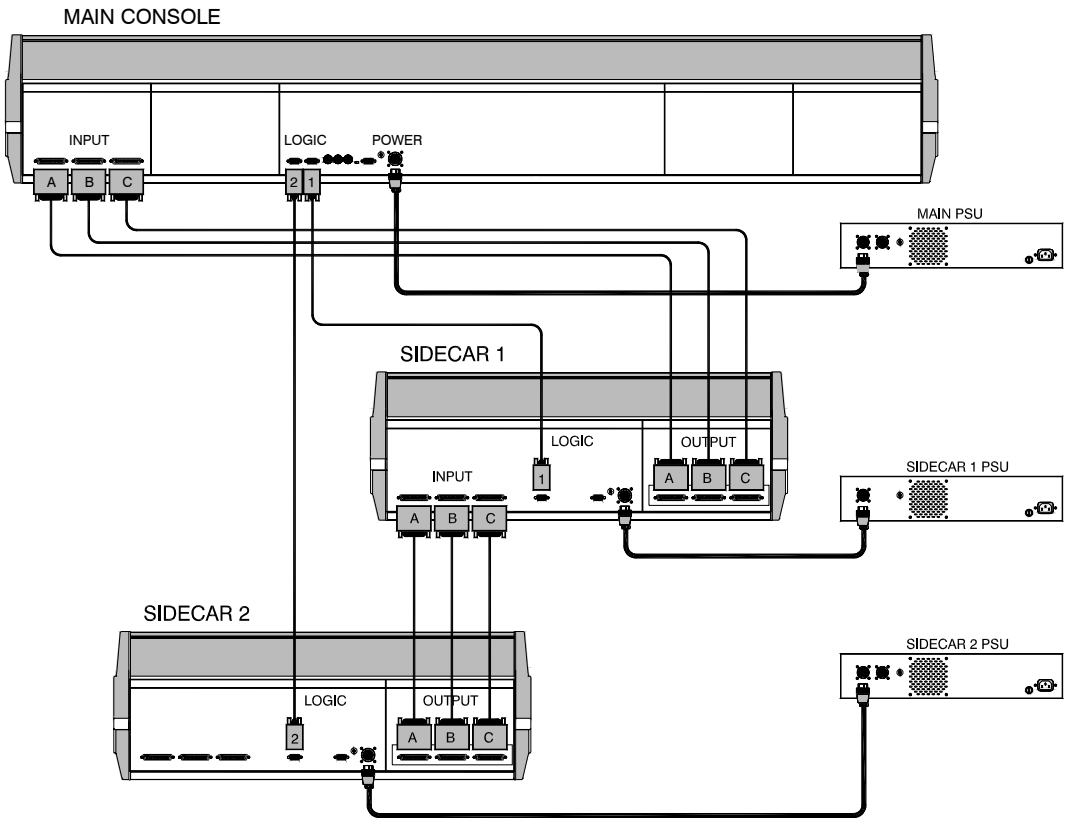
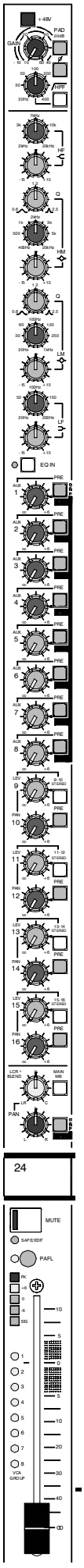


Diagram 3

CONNECTING TWO SIDECARS

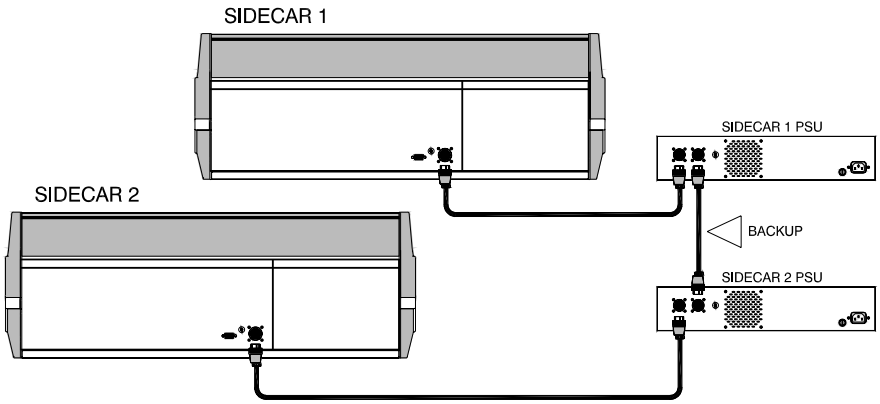




Combining Sidecar Power Supplies for Backup

If you are connecting two sidecars then you can link the power supplies together for redundant supply backup. One **MPS14** supply is capable of running both sidecars together should the other fail. You need to order the short 0.7 meter DC power cable (part 002-584) for linking.

Note: Do not link the main console power supply to the sidecar supply in this way. One supply is not capable of running both the main console and its sidecar should the other fail. You should order a spare power supply with your console in this case. Make sure the power supplies are positioned next to each other and using the same mains distribution.



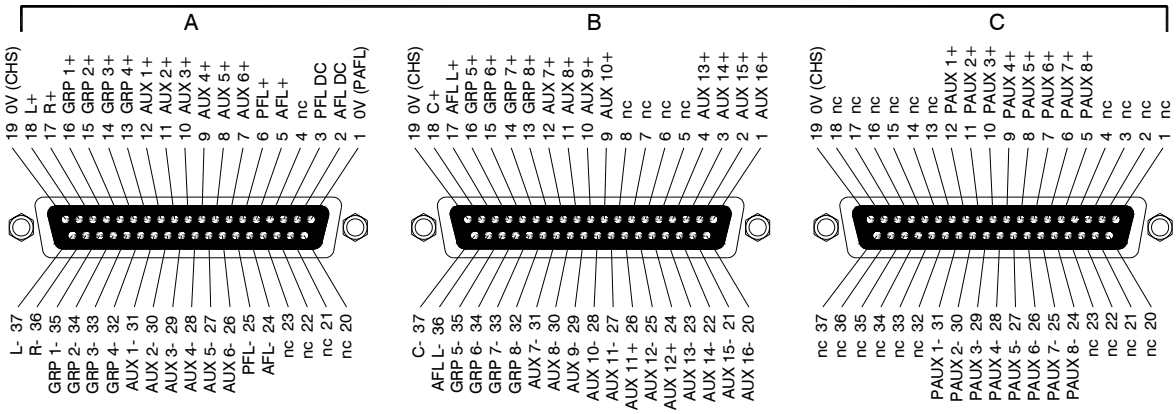
RS232 Code Update

A rear panel RS232 port is provided. This is used for loading new operating software into the sidecar from a PC. It is not used for any other function. Check our Web site www.allen-heath.com for details on the latest version of **ML5000** operating software and instructions on loading it into the console.

Note: The sidecar settings are archived using a MIDI or RS232 dump from the main console. There is no need to archive the sidecar settings separately.

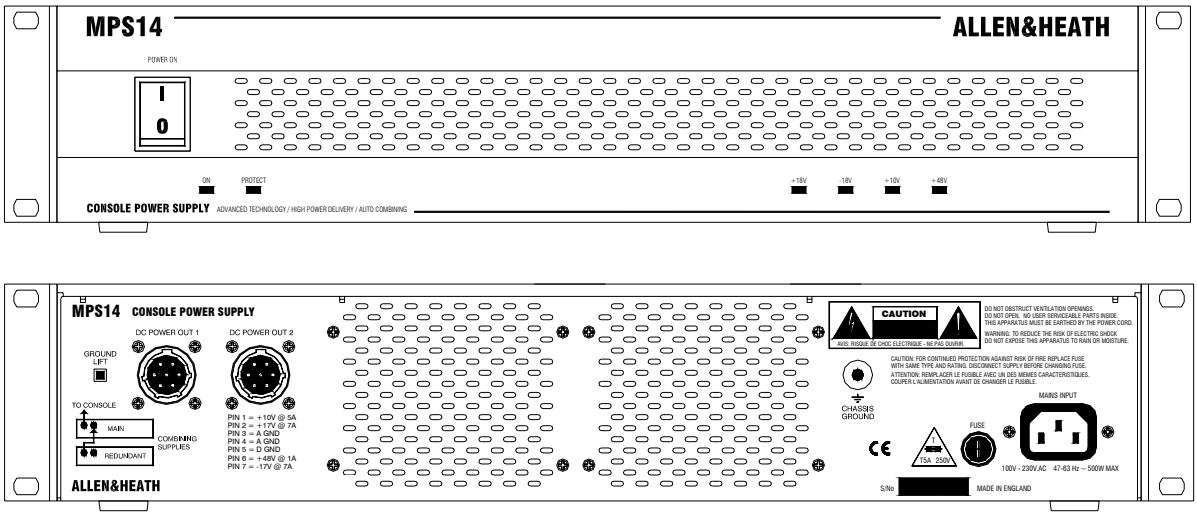
Sidecar Audio Connections

The following information is provided for reference only. It is not necessary to wire special cables to connect the sidecar to the console. Standard 1 to 1 wired 37way cables are provided. The audio signals are balanced and operate at a nominal –2dBu line level.



The MPS14 Power Supply

The slimline MPS14 power supply uses linear post-regulated switch mode technology to generate the DC voltages required by the console. It will operate from a wide range of ac mains input voltages. Full protection and thermally controlled fan cooling ensures the power unit will operate consistently. The MPS14 also has a built in combiner for connection to a second supply for backup.



Power Supply Installation

Free standing

The MPS14 can be operated as a free-standing unit without requiring any special cooling arrangement, but should not be accidentally or deliberately covered in any way. Always stand the unit on a firm flat surface well away from any soft furnishings or carpet.

Rack mounting

The MPS14 is designed as a 19 inch rack mount unit and will occupy 2U (3.5 inches) of rack space.

An important consideration when rack-mounting the unit is the need for natural convection of air flow over the whole unit.

Good ventilation below the unit, in the floor or back of the rack, will ensure a path for continuous air flow.

Other equipment in the rack which is known not to produce a significant amount of heat should be mounted below the unit. Equipment which also relies on good airflow within the rack (i.e. most power amplifiers and other power supplies) should be given due consideration and some space should be provided between such units and between the MPS14 unit. Forced convection, by means of a fan-tray, may be desirable in this situation.

Location

As with any power supply that contains switch mode technology, it is preferable to provide a degree of physical isolation of the unit from other equipment, particularly that which carries low level audio signals, to avoid any possible interference pick-up. For this reason the unit is provided with a long (2.9m) output cable to enable it to be positioned away from the mixing console. For the same reason, when rack-mounting it is preferable to avoid locating the unit adjacent to signal processing equipment.

Earthing

Finally, some consideration should be given to the earthing arrangement of the system, at the centre of which is the console and the MPS14. The console chassis is earthed, to the mains earth, via the power supply. When rack-mounting the MPS14 care should be taken to avoid any possible “ground loops” in the system which would introduce audible hum or buzz to otherwise clean audio signals. Ground loops may occur where signal processing equipment patched to the console, has its signal earth connected to the equipment chassis. A ground loop is formed if the chassis of the signal processing equipment and the MPS14 chassis are in electrical contact through the fixing rails they share in the rack. The MPS14 has audio 0V and mains earth connected internally. If a ground loop is formed operation of the ground lift switch on the rear panel of the MPS14 may improve the situation.

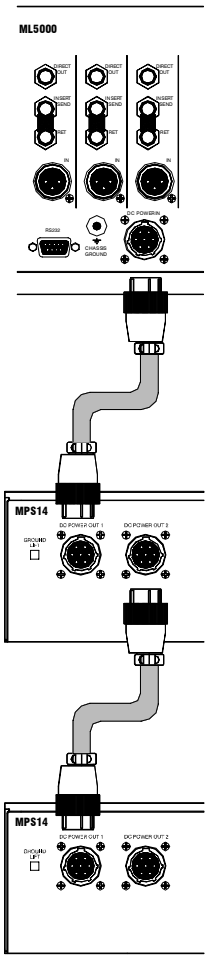
MPS14 Technical specifications

Mains Input Voltage Range	100 - 240 ± 10% VAC @ 47-63 Hz auto-sensing
Power consumption (max.)	500W

Mains Fuse: 100 - 240 V~ T 5.0A/250V

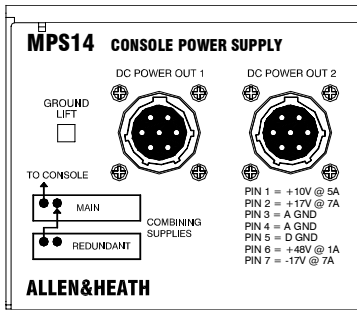
Internal Fuses:

PCB Ident	Fuse type
F1 (+12V)	T 6.3A 250V 20mm
F2 (+48V)	T 2A 250V 20mm
F18 (aux psu)	T 500mA 250V 20mm



DC Outputs

DC Voltage Rail	Output Current
+17 VOLTS	7A Max.
-17 VOLTS	7A Max.
+12 VOLTS	5A Max.
+48 VOLTS	500mA Max.



DC Output Socket Pin Connections

Pin No:	Connection
1	+12 Volts
2	+17 Volts
3	A GND
4	A GND
5	D GND
6	+48 Volts
7	-17 Volts

Overall Dimensions

Front Panel:	482mm x 88mm	19 inch 2U
Width (excluding rack ears):	440mm	17.30 inches
Height including feet:	90mm	3.5 inches
Depth:	260mm	10.25 inches
Weight:	6Kg	13 pounds

Cable Assemblies

Assembly	Description	A&H Part no:
DC cable	2.9m MPS14 to ML5000 console cable assembly	002-583
DC LINK cable	0.5m MPS14 to MPS14 PSU “LINKING” cable assembly	002-584

ML5000 Technical Specifications

0dBu = 0.775 Vrms, +4dBu = 1.23 Vrms

Operating Levels
Channels ..... 0dBu Headroom +21dB
Mix ..... -2dBu Headroom +23dB

Frequency Response Referred to 1kHz at +4dBu
Mic to main output (+40dB)..... 20Hz to 30kHz +0/-0.5dB
Line to main output (0dB)..... 20Hz to 30kHz +0/-0.5dB

Distortion @1kHz +14dBu
THD+noise ..... < 0.01%

CMRR Common mode rejection @1kHz
Mic (+40dB)..... > 80dB
Mic + Pad (0dB) ..... > 50dB

Crosstalk Referred to driven channel @1kHz
Channel to channel ..... > -100dB
Mute shutoff ..... > -85dB
Fader shutoff ..... > -90dB

Noise Performance Measured rms 22Hz to 22kHz unweighted
Mic EIN with 150 ohm source ..... -128dB
Residual output noise ..... < -94dBu (-98dB SN)
Mix noise, nothing routed ..... < -84dBu (-88dB SN)
Mix noise, 24 channels routed ..... < -80dBu (-84dB SN)

Metering
Reading 0..... +4dBu at XLR outputs
LED meters ..... Peak reading, 3 colours
VU meters ..... Ave reading, Illuminated moving coil
Peak indicators ..... 5dB before clip, multi-point sensing
Input meters ..... 5 bar LED (signal, -6, 0, +6, peak)
Group mix meters .... 5 bar LED (signal, -6, 0, +6, peak)
Group/Mtx meters .... VU
L,R,C meters ..... VU and 16 bar LED

Lamp Connectors x4
Connector ..... XLR-F 4pin
Rating..... 12V 400mA max

Channel Filters
Slope ..... 12dB/oct high pass
Frequency ..... 20Hz to 400Hz variable

Mono Equaliser
HF..... +/-15dB, 2kHz to 20kHz shelf
HM..... +/-15dB, 500Hz to 15kHz bell, Q = 0.6 to 2.5
LM ..... +/-15dB, 35Hz to 1kHz bell, Q = 0.6 to 2.5
LF ..... +/-15dB, 20Hz to 200Hz shelf

Stereo Equaliser
HF..... +/-15dB, 12kHz shelf
HM..... +/-15dB, 2.5kHz bell
LM ..... +/-15dB, 250Hz bell
LF ..... +/-15dB, 60Hz shelf

Power Supply Model MPS14
Type ..... External 2U rack or floor mount
Mains input..... 100-230V 50/60Hz universal input
Power consumption.... 500W
Full protection and fan cooling

Dimensions	Width.....	Depth.....	.....Height
32 Channel	1596 (62.8”) ...	872 (34.3”)	....298 (11.7”)
40 Channel	1851 (72.9).....	872.....	298
48 Channel	2106 (82.9”) ...	872.....	298
Sidecar	831 (32.7”)	872.....	298
MPS14 psu	483 (19”)	260 (10.2”)	....

Weights	
	32 Channel..... 84 kg (185 lbs)
	40 Channel..... 96 kg (211 lbs)
	48 Channel..... 110 kg (242 lbs)
	24 Sidecar..... 45 kg (99 lbs)
	MPS14 psu .... 6 kg (13 lbs)

INPUTS:

Mic (Pad out).....	XLR.....	balanced, pin2+.....	2k ohm.....	variable -60 to -10dBu.....	Max +11dBu
Mic (Pad in).....	.....	.....	>20k ohm.....	variable -40 to +10dBu.....	Max +31dBu
Stereo A	TRS jack.....	balanced, tip+.....	>20k ohm.....	variable -18 to +6dBu.....	Max +27dBu
Stereo B	XLR.....	balanced, pin2+.....	>20k ohm.....	variable –18 to +6dBu.....	Max +27dBu
2-Track.....	TRS jack.....	balanced, tip+	>20k ohm.....	+4dBu.....	Max +25dBu
Matrix Ext in	TRS jack.....	balanced, tip+.....	>20k ohm.....	+4dBu.....	Max +25dBu

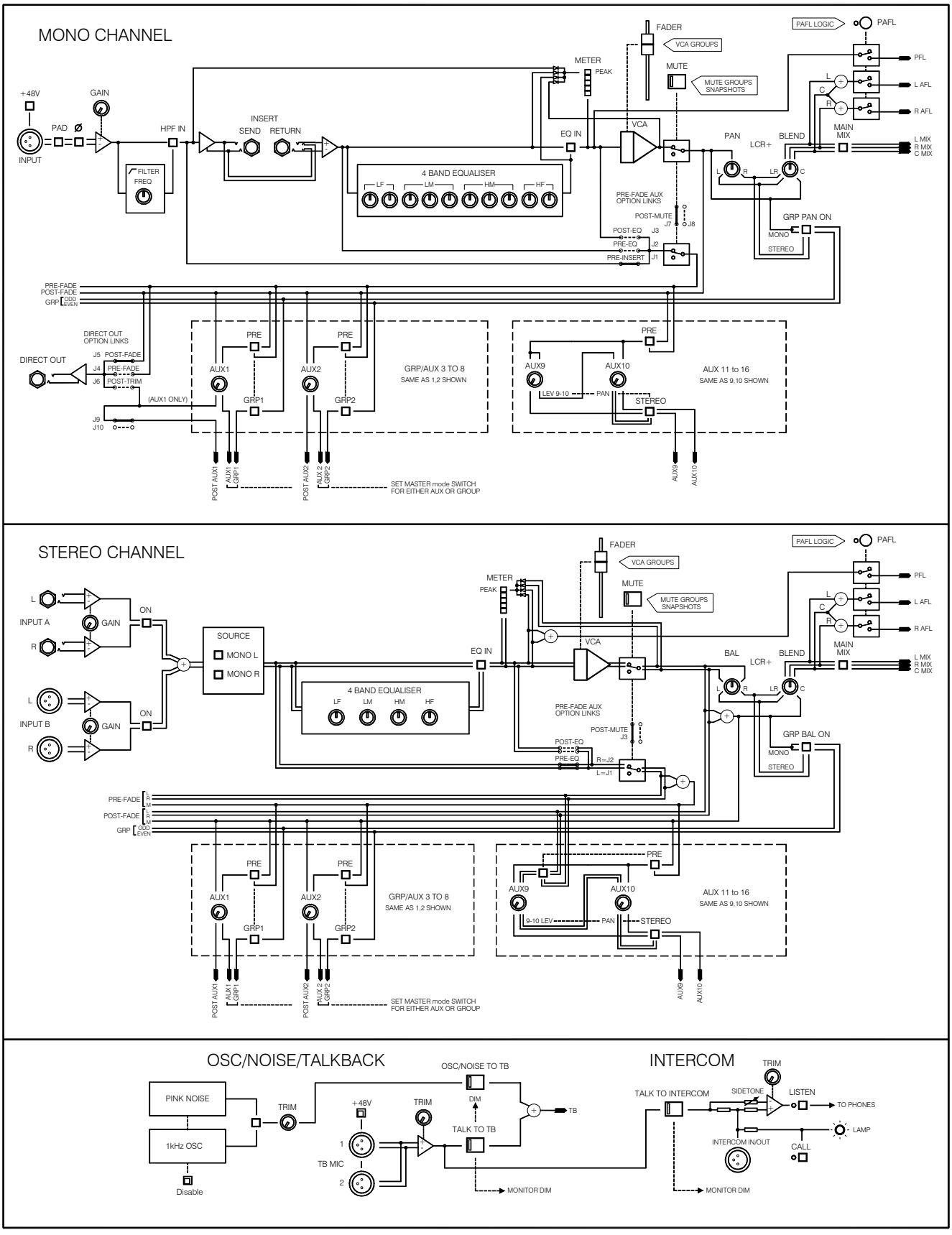
INSERTS:

Input send	TRS jack.....	ground comp, tip+	<50 ohm.....	0dBu.....	Max +21dBu
Input return.....	TRS jack.....	balanced, tip+.....	>20k ohm.....	0dBu.....	Max +21dBu
Output send	TRS jack.....	ground comp, tip+	<50 ohm.....	-2dBu.....	Max +21dBu
Output return.....	TRS jack.....	balanced, tip+.....	>20k ohm.....	-2dBu.....	Max +21dBu

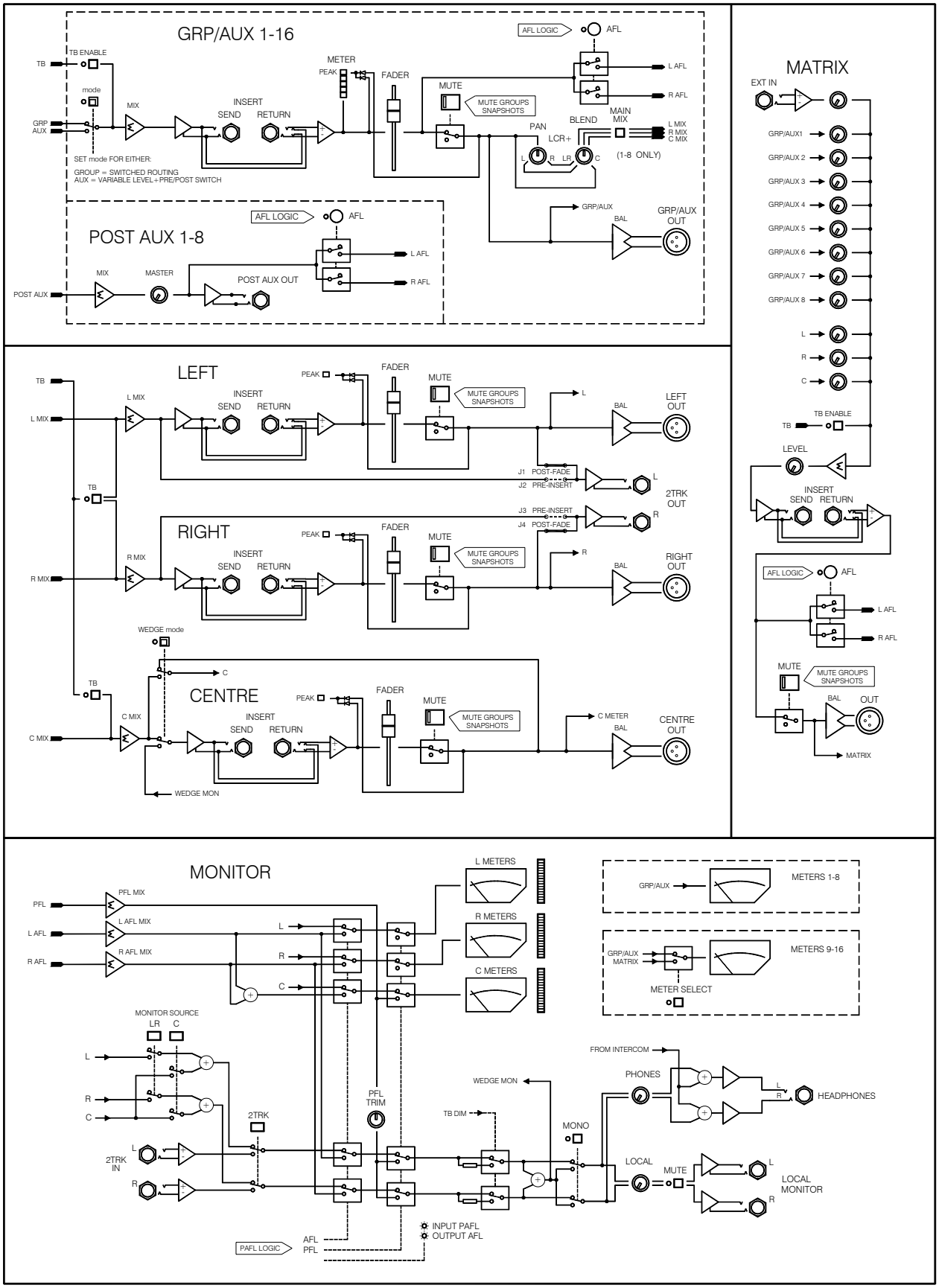
OUTPUTS:

L,R,C.....	XLR.....	balanced, pin2+.....	<75 ohm.....	+4dBu.....	Max +26dBu
Grp/Aux 1-16.....	XLR.....	balanced, pin2+.....	<75 ohm.....	+4dBu.....	Max +26dBu
Matrix 1-8.....	XLR.....	balanced, pin2+.....	<75 ohm.....	+4dBu.....	Max +26dBu
Post Aux 1-8	TRS jack.....	ground comp, tip+	<50 ohm.....	-2dBu.....	Max +21dBu
Direct out.....	TRS jack.....	ground comp, tip+	<50 ohm.....	0dBu.....	Max +21dBu
2-Track.....	TRS jack.....	ground comp, tip+	<50 ohm.....	+4dBu.....	Max +21dBu
Local Monitor	TRS jack.....	ground comp, tip+	<50 ohm.....	0dBu.....	Max +21dBu
Headphones.....	TRS jack.....	tip left, ring right.....	for stereo headphones >30 ohms		

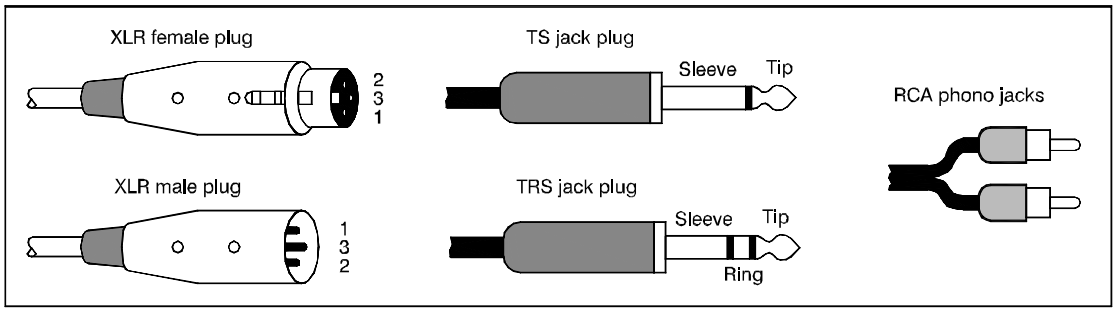
System Block Diagram (1 of 2)

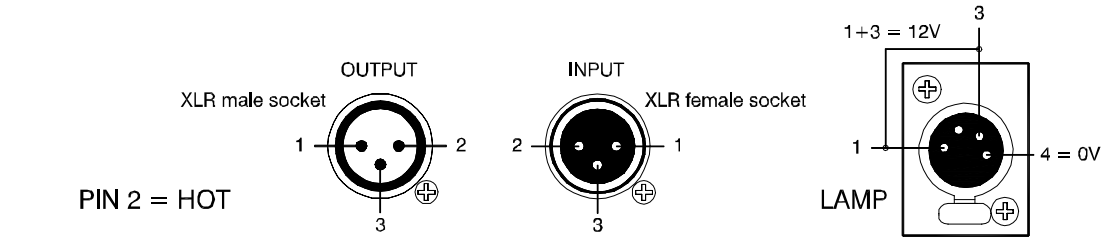


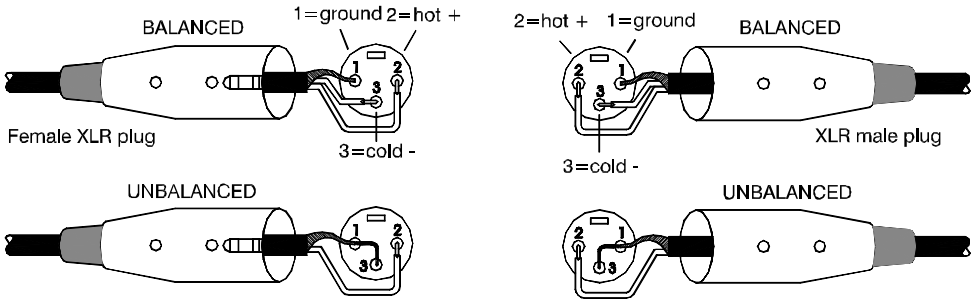
System Block Diagram (2 of 2)

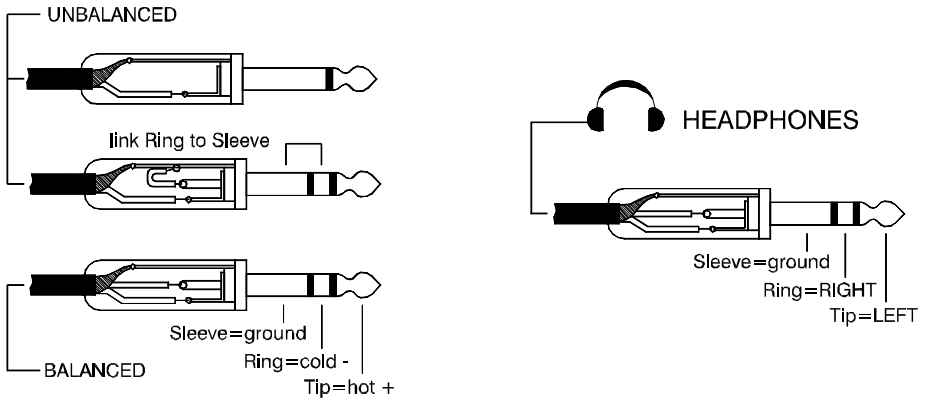


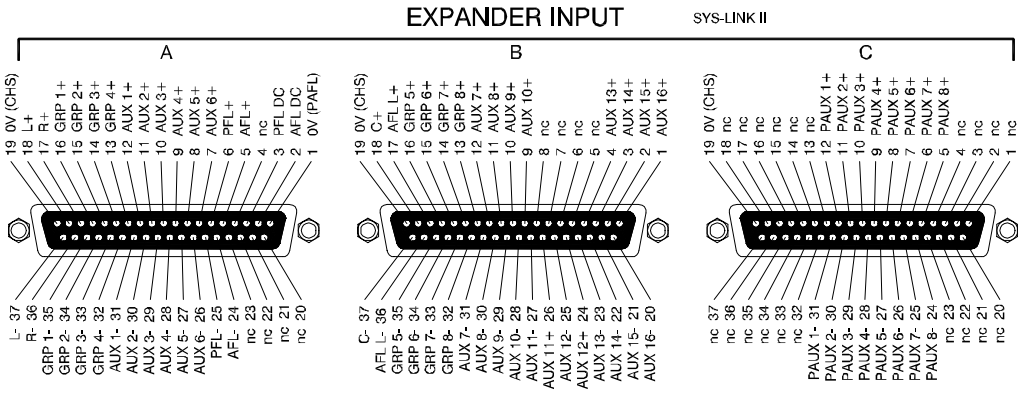
Connector Types and Wiring











Gain Structure (Reprinted from User Guide)

How the levels between the different signal stages are set up is referred to as the gain structure. For best performance it is important that the connected source signals are matched to the 'normal operating level' of the console. Similarly the levels of the connected amplifiers and destination equipment should be correctly matched to the console outputs. If set too high then the signal peaks will be clipped resulting in distortion, and if set too low then the signal-to-noise performance will be degraded resulting in excessive background hiss and noise.

Using the Meters. The **ML5000** provides metering at all important stages through the signal chain. For best results operate the console with the LED bar meters averaging around '0' allowing the loudest moments to reach '+6'. Reduce the gain if the red peak LEDs start to flash. Note that the peak leds light 5dB before actual clipping to warn that you are nearing distortion and should reduce gain. The LED bar meters have a peak response with fast attack and slow release so that fast musical transients are accurately displayed. The VU meters have a slower attack so that the average levels are better displayed. Both types of metering are useful in live sound mixing.

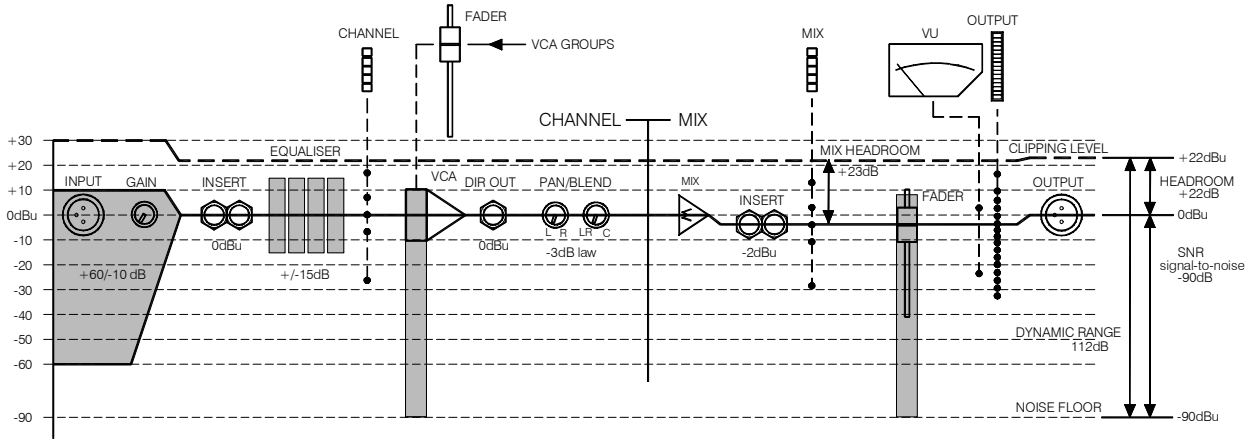
Matching a Source to the Console. Start by turning down the channel fader and send levels to prevent unexpected loud volumes reaching the main speakers and monitors. Adjust the GAIN control for an average '0' reading on the channel meter. Press PAFL (in PFL mode) to listen to the signal using headphones, local or wedge monitor, and to view its level on the main LED and VU meters. Once the gain is correctly set you can raise the levels to bring the channel into the mix. Note that you may need to adjust the gain if you make significant changes to the EQ. Make sure that any equipment inserted into the channel is set to operate around 0dBu line level. It is best to first set the gain with inserted signal processors such as compressors switched to bypass.

Matching the Console to Destination Equipment. The console produces a standard XLR output level of 0dBu for a meter reading of '0' and +22dBu maximum to allow plenty of headroom for driving equipment hotter. If you are connecting directly to a sensitive power amplifier it is advisable to turn down its input trim control if the normal console level is too high. Simply turning down the console output faders degrades the output stage noise performance and reduces the resolution of the fader movement. The output faders are best operated around '-10' to '0' for loudest average volume required. This allows plenty of additional headroom if you need it. If you are connecting to crossovers or speaker managers then set these for normal 0dBu operating level and use their level trimmers to correctly match to the amplifiers.

Terminology. The **normal operating level** is the optimum signal level for best console performance, indicated by '0' meter readings. The channels operate at 0dBu and the mix stages at –2dBu for extended headroom. **Headroom** is the extra level available above normal to allow for loud peaks before the signal becomes **clipped** resulting in audible distortion. The **signal-to-noise ratio** (SNR) is the difference measured in dB between normal level and residual noise floor (hiss) produced by the console electronics. The **dynamic range** is headroom + SNR representing the maximum signal range possible from quietest to loudest.

Using the VCA Groups. Assigning a channel to one or more VCA groups lets those group faders control the level of its VCA element. Each fader provides up to +10dB boost. Note that the channel VCA allows a maximum combined fader boost of +10dB. Any more is simply ignored. It is best to operate the VCA group faders around their nominal '0' position. You can also use a VCA group to reduce the overall level of a hot mix without having to adjust all the channel faders.

Final word… A little care with setting gain structure throughout the signal chain will give you the very best performance and most manageable control of the mix.

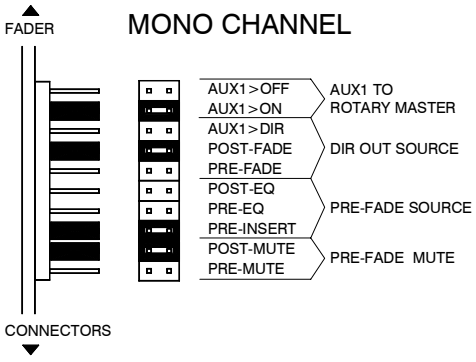


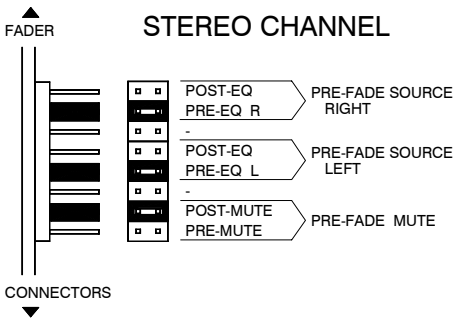
Channel Jumper Options

Several link options are available to satisfy user preferences. These require removal of the console base panels and replugging of 2way jumpers on the circuit boards. It is not necessary to remove assemblies from the console. To avoid damage to the internal assemblies this work should be carried out by competent technical personnel.

Pre-fade Source. The source for the pre-fade aux sends may be changed by repositioning jumper links on each mono and stereo channel. The default factory setting is pre-insert, pre-EQ, post-mute. This is usually preferred when mixing monitors from front-of-house. Select the source as pre-insert, pre-EQ, or post-EQ by setting one jumper. Select pre or post mute by setting another. Set pairs of links on the stereo channels to affect left and right signals.

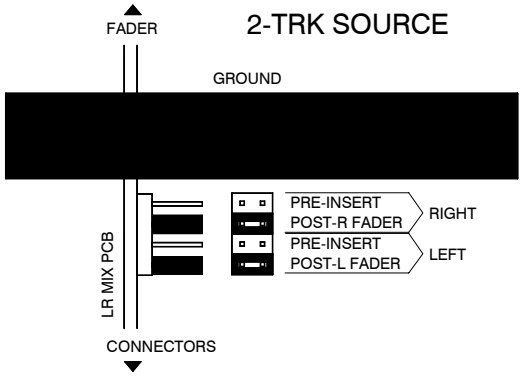
Direct Output Source. The default factory setting is post-fade. This can be changed to pre-fade. Pre-fade follows the source as described above. An additional option sources the output from the AUX1 send control. This provides a post-fade direct output with level trim. If preferred, the channel feed to the AUX1 rotary master can be disabled so that adjusting the direct output level does not feed the mix. Note that this does not affect the AUX1 send to the fader master when aux mode is selected. Select the source as pre-fade, post-fade, or post-fade with AUX1 trim by setting its jumper. Set another jumper to turn the AUX1 feed to the rotary master on or off as required.





2-TRACK Jumper Options

The 2-track output is sourced from the main LR mix. The factory default setting is post master LR faders. If you want to source pre-insert, pre-fader then replug the internal jumper links on the LR MIX circuit board as shown below. For stereo recording from a three channel LCR mix, or by creating a new balance from the groups, use the MATRIX outputs instead.



MIDI Mutes

HEX	MUTE
00	GRP/AUX 1
01	GRP/AUX 2
02	GRP/AUX 3
03	GRP/AUX 4
04	GRP/AUX 5
05	GRP/AUX 6
06	GRP/AUX 7
07	GRP/AUX 8
08	AUX 9
09	AUX 10
0A	AUX 11
0B	AUX 12
0C	AUX 13
0D	AUX 14
0E	AUX 15
0F	AUX 16
10	MATRIX 1
11	MATRIX 2
12	MATRIX 3
13	MATRIX 4
14	MATRIX 5
15	MATRIX 6
16	MATRIX 7
17	MATRIX 8

HEX	MUTE
50	STEREO 1
51	STEREO 2
52	STEREO 3
53	STEREO 4
54	MAIN L
55	MAIN R
56	MAIN C

HEX	MUTE
20	CH 1
21	CH 2
22	CH 3
23	CH 4
24	CH 5
25	CH 6
26	CH 7
27	CH 8
28	CH 9
29	CH 10
2A	CH 11
2B	CH 12
2C	CH 13
2D	CH 14
2E	CH 15
2F	CH 16
30	CH 17
31	CH 18
32	CH 19
33	CH 20
34	CH 21
35	CH 22
36	CH 23
37	CH 24

HEX	MUTE
38	CH 25
39	CH 26
3A	CH 27
3B	CH 28
3C	CH 29
3D	CH 30
3E	CH 31
3F	CH 32
40	CH 33
41	CH 34
42	CH 35
43	CH 36
44	CH 37
45	CH 38
46	CH 39
47	CH 40
48	CH 41
49	CH 42
4A	CH 43
4B	CH 44
4C	CH 45
4D	CH 46
4E	CH 47
4F	CH 48

Pressing any input or output channel MUTE switch transmits a MIDI Note On message. Similarly, receiving a MIDI Note On message will turn the associated channel mute on or off, unless the channel has been made automation safe.

Console mutes are mapped to MIDI Note numbers as shown in the table. Running status is supported on receive and transmit.

Transmit. Pressing a channel MUTE switch transmits the following Note On messages:

9n cc vv 9n cc 00

Where n = console MIDI channel number
cc = input or output channel number
vv = 3FH for mute off, 7FH for mute on

Receive. The console responds to the following MIDI Note On message:

9n cc vv (00 is ignored)

Where vv < 40 = mute off,
40 <= vv <= 7F = mute on

Snapshot Memories

Recalling a snapshot will transmit a MIDI Program Change message. Receiving a Program Change message will recall a snapshot.

Snapshot numbers 1 to 128 are mapped to MIDI Program Change numbers 0 to 127. Running status is supported on receive and transmit.

Transmit and Receive. The message format is:

Cn pp

Where n = console MIDI channel number
pp = console snapshot number 00 to 7F

MIDI AFL Messages

SysEx message strings are transmitted each time an output channel AFL switch is selected or released. These are for use with **BSS** and **dbx** speaker management systems to automatically select the remote control surface associated with the output being AFL monitored.

BSS Omnidrive

F0 00 20 18 7F 20 tx_event F7

dbx Drive Rack

F0 00 01 1E 7F 7F 20 tx_event F7

These messages are subject to further development and addition. Please check the Allen & Heath Web site for the latest information.

Archiving the Console Settings

The console settings can be saved to an external device such as a MIDI sequencer or data archiver using the dump out facility. Saved settings can be loaded back into the console using dump in. This is ideal when you want to archive the settings to use at a later date, for example a re-run of a previous performance. You can also use the dump facility to program additional **ML5000** consoles, for example when setting up duplicate shows or swapping consoles around. Simply link MIDI OUT from one to MIDI IN of the other and action the dump out facility.

Settings which are archived :

- ✓ Current mute settings
- ✓ Current Mute group assignments
- ✓ Current VCA group assignments
- ✓ Automation safes
- ✓ Solo-in-Place safes
- ✓ All snapshot memories

Settings which are not archived :

- × Current console operating mode
- × Current PAFL selection and settings
- × Store and auto-increment on/off

MIDI Dump Out

Connect the console to a suitable MIDI archiving device. Set the same MIDI channel number on both. Check the rear switch is set to MIDI. Hold down SHIFT [M9] and press STORE [M4]. The console dumps the current settings and memory contents using a SysEx message string. During this time **dPo** is displayed. Note that this operation can take up to 10 seconds during which time the console mutes, assignment, SIP and P/AFL operations will be interrupted.

MIDI Dump In

Connect the console to the MIDI archiving device. Set the same MIDI channel number on both. Check the rear switch is set to MIDI. Start the process using the MIDI archiver. The console current settings and memory contents are overwritten. During this time **dPI** is displayed. Note that this operation can take a while during which time the console mute, assignment, SIP and PAFL operations will be interrupted.

If you are using a MIDI sequencer to record the dump out data string then make sure you play it back at the same speed you recorded it. If you dump it back into the console faster than it was recorded some data may not load correctly.

MIDI Dump Message Format

The format for dump out and in is identical. The dump data string is made up of multiple System Exclusive messages (known as packets) which contain the console information.

Transmit and Receive. The format for a single packet is as follows:

F0 <SysEx header> <packet type> <packet number> <data> <checksum> F7

<SysEx header> = 00 00 1A 50 07 VV vv nn

Where VV = software version number – unit
vv = software version number – decimal
nn = console MIDI channel number

<packet no.> = packet number from 0 to 127

<data> = block of console data (7-bit format)

<checksum> = checksum to allow error detection

MIDI Dump Errors

If the console or connected equipment fails to respond to a MIDI dump then check:

- The MIDI cable is good and correctly plugged
- The same MIDI channel number is selected
- The rear panel switch is set to MIDI
- Try again

If a data error is detected during a dump out or in the console display will show an error message code:

Er1	Buffer overflow
Er2	Packet out of sequence / missing
Er3	Checksum error / corrupt data
Er4	Invalid packet length
Er5	Input timeout
Er6	Unsupported block type
Er7	Invalid scene number
Er8	Block size error

Allen & Heath ML Archiver

The ML Archiver Windows™ utility for the PC can be downloaded from the Allen & Heath Internet site. This can be used to archive data to and from the PC via MIDI or RS232.

Check the Allen & Heath Web site for further details and loading instructions.

Operating Software Technical Support

Operating Software Version Number

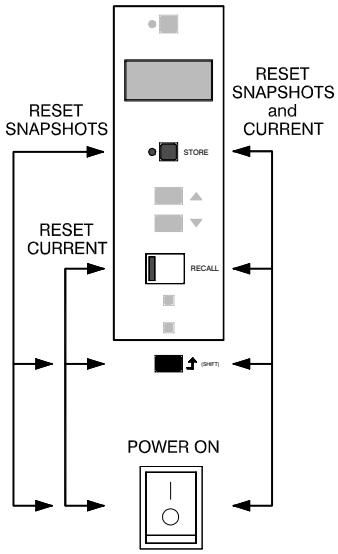
The version number is briefly shown on the snapshot display on power up. Make sure the system amplifiers are muted or turned off before switching the console on or off. This example displays version **1.20**

Loading New Operating Software

Check the Allen & Heath Web site for the latest version of console software. New software is loaded from a PC via the RS232 port.

IMPORTANT ! The current console settings and snapshots may be lost when you load new operating software. If you wish to keep your settings and snapshot contents, first archive them using the dump out facility. Restore these after loading the new software by using dump in.

Download the software from the Allen & Heath Web site to your PC computer. Connect the PC RS232 port to the console RS232 port using a standard pin-to-pin (not null modem) 9-pin serial cable. Set the console rear panel switch to the RS232 position. Power up the console. The snapshot display should read **UPd** (update) as the console awaits data from the PC. Follow the instructions provided on the Web site for loading the new software into the console. When completed make sure you set the console rear panel switch back to the MIDI position.



Power Up and Power Down

The console settings are saved when power is removed. On power up these settings are restored.

To Reset the Console Settings

Hold down SHIFT and RECALL while turning on the console to reset all current settings. This does not affect the contents of the snapshot memories. The default settings are restored:

- Selects normal console operating mode
- Clears current P/AFL selections
- Clears all current Mute Group assignments
- Clears all current VCA Group assignments
- Clears all channel automation safes
- Restores the default SIP safes
- Enables the snapshot store function
- Turns off recall auto-increment

To Reset the Snapshot Memories

Hold down SHIFT and STORE while turning the console on to clear all the snapshot memories. This does not affect the current console settings. For all snapshots:

- Clears all stored mutes
- Clears all stored VCA Group assignments

To reset all Settings and Memories

Hold down SHIFT, RECALL and STORE together while turning the console on to clear all current settings and the memories.

Contacting Allen & Heath

If you have any queries about the automation system please quote the console model, serial number and operating system version number in any communication with Allen & Heath or your appointed service agent. Technical support is available through your dealer or by visiting the Allen & Heath Internet Web site.

www.allen-heath.com

Servicing the Input Fader assembly

Before beginning any service work, remove all power to the unit and disconnect any signal cables where necessary. Ensure adequate lighting and use the correct tools.

Remove the numbered Ident strip by placing a flat headed screwdriver under one end and prizing it upwards. Remove the Ident strip by 'peeling' it from one end of the console to the other.

Remove the 3x 6Bx3/8 Countersunk Pozi Zinc Screws from the top of the fader panel **(A)** and the 3x 6Bx3/8 Flange Headed Pozi Black Screws from the bottom of the fader panel, taking care to retain the plastic washers **(B)** (see fig.1). Carefully tilt the fader panel assembly out from the console and remove all connecting IDC wireforms. The fader panel assembly can now be removed from the console.

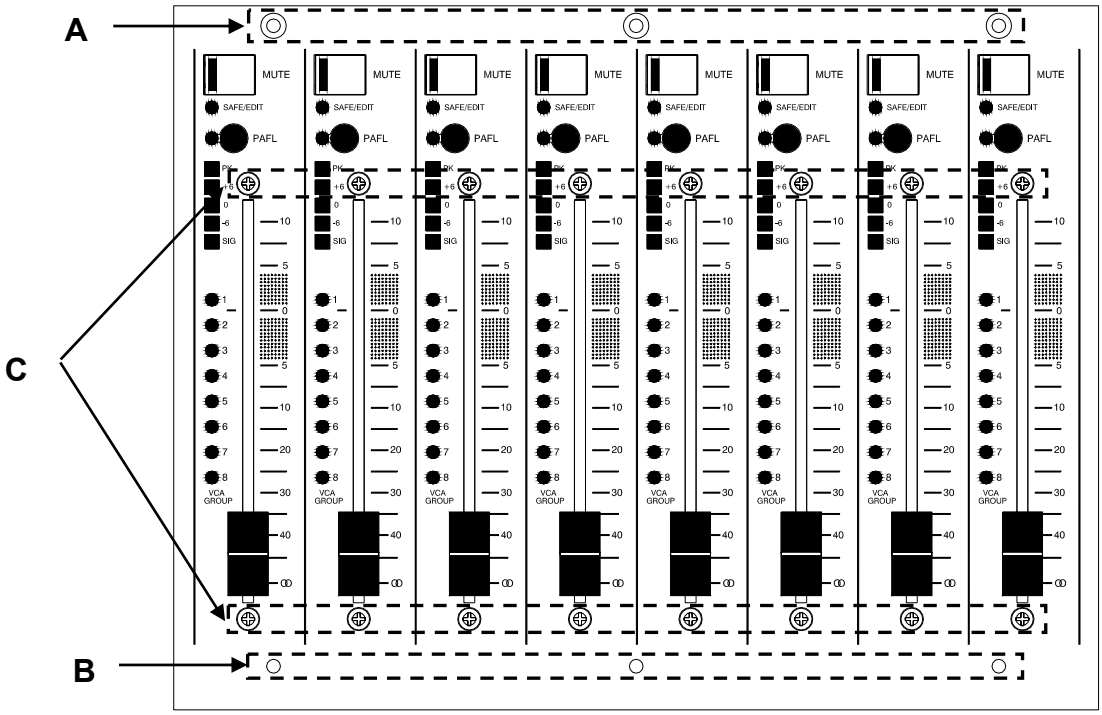


fig.1

3) Flip the fader panel over and remove the 2x 4ABx5/16 Countersunk Pozi Black Screws **(D)** from the **Fader Slave PCB** (see fig.2)

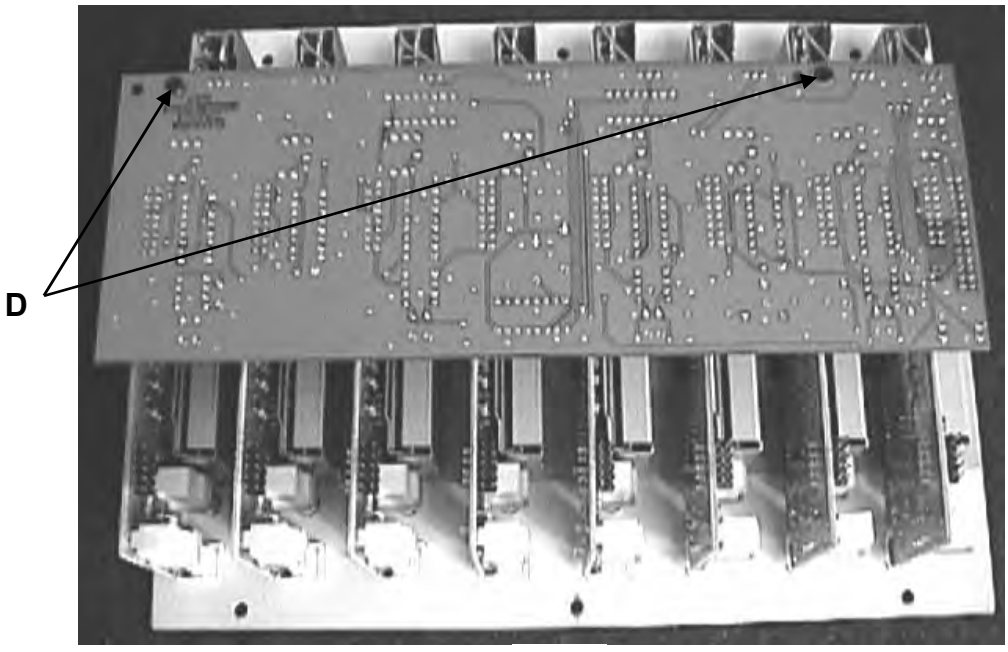


fig.2

4) Carefully remove the **Fader Slave PCB** from the **Mono Fader PCBs** by pulling it upwards from the fader boards.

5) Once removed, turn the **Fader Slave PCB** over (see fig.3)

To remove a **Mono Fader PCB**, use a 5.5mm spanner to remove the relevant M3x4 Taptite Hex Headed Screws **(E)** that attach the **Mono Fader PCBs** to the **Input Fader Bracket** (see fig.3).

To remove a fader remove the two relevant M3x5 Countersunk Pozi Screws with under-head pips **(C)** as shown in fig.1. Then unplug the fader wireform from the **Fader Slave PCB**, the fader can now be removed. De-solder the three fader wireform wires from the fader, taking note of the wire positions for refitting.

Note: A fader can be removed without removing the IDC wireforms and Slave PCB.

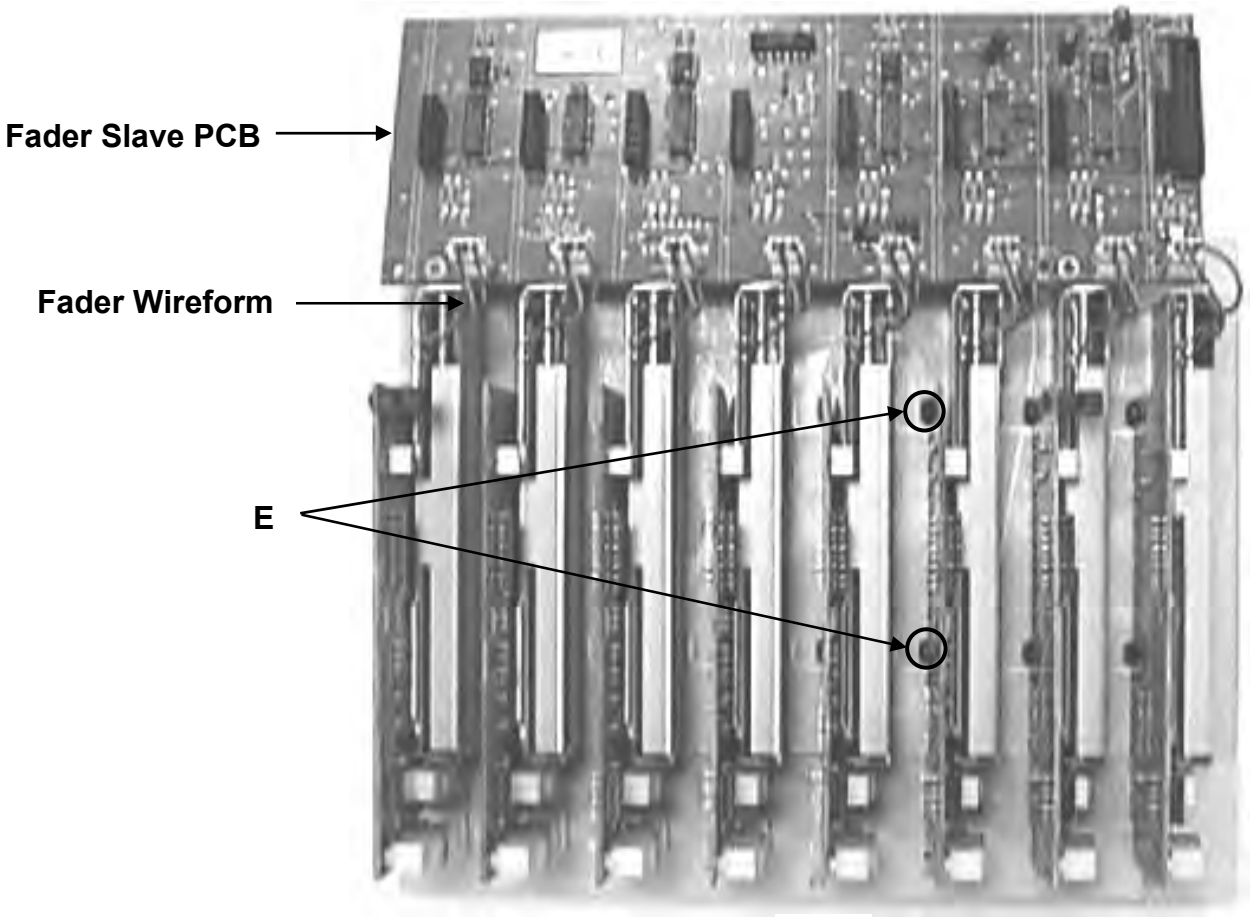


fig.3

To refit any of the PCB/Fader assemblies, follow the above procedure in reverse order. **Ensure all connectors and harnesses are correctly aligned and plugged on.** Test for correct operation.

Servicing the Master Fader assembly

Before beginning any service work, remove all power to the unit and disconnect any signal cables where necessary. Ensure adequate lighting and use the correct tools.

Remove the numbered Ident strip by placing a flat headed screwdriver under one end and prizing it upwards. Remove the Ident strip by 'peeling' it from one end of the console to the other.

Remove the 5x 6Bx3/8 Countersunk Pozi Zinc Screws from the top of the fader panel **(F)** and the 5x 6Bx3/8 Flange Headed Pozi Black Screws from the bottom of the fader panel, taking care to retain the plastic washers **(G)** (see fig.4). Carefully tilt the fader panel assembly out from the console and remove all connecting IDC wireforms. The fader panel assembly can now be removed from the console.

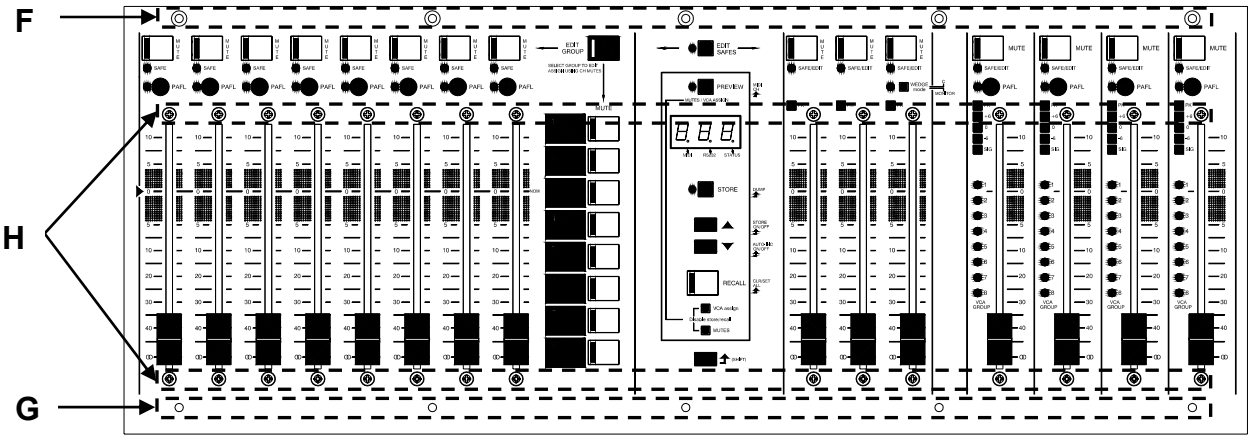


fig.4

Flip the fader panel over to reveal the PCB assemblies (see fig.5).

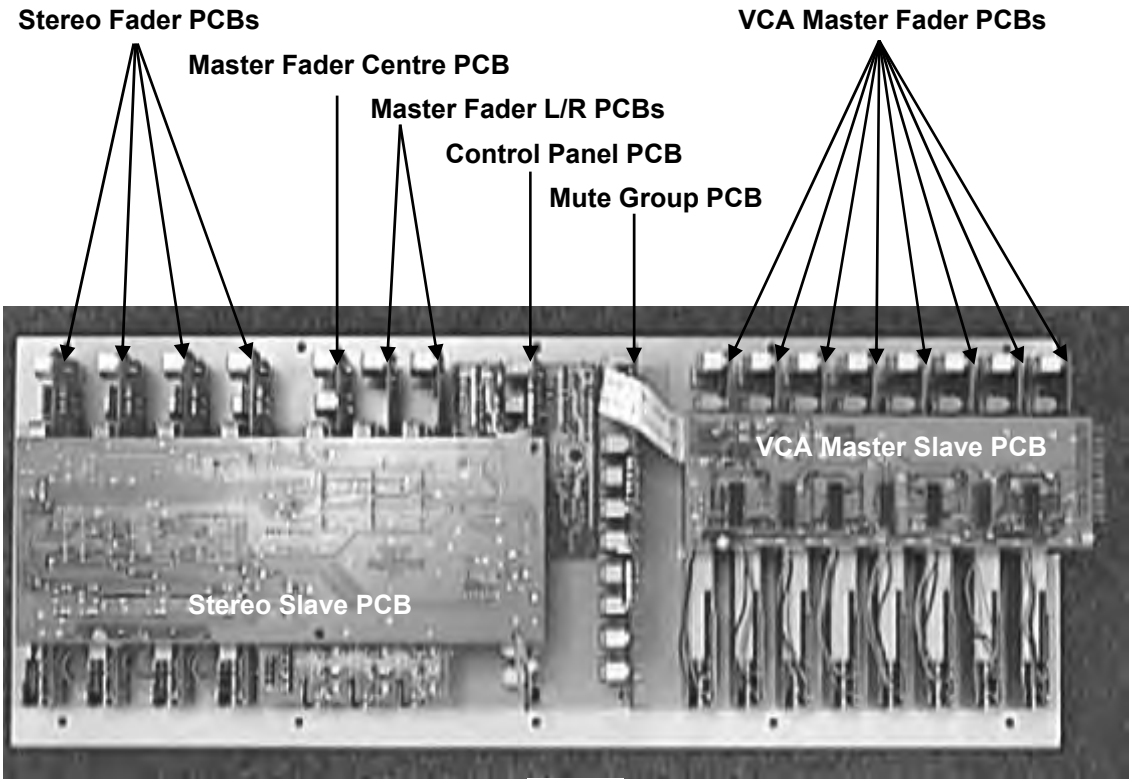


fig.5

The **Stereo Slave PCB** must be removed before the following PCBs can be removed; **Mono Fader, Master Fader Centre, Master Fader L/R & Control Panel.**

1) Cut the 2x Cable ties attaching the **Stereo Slave PCB** onto the **Mono Fader & Control Panel PCBs.**

2) Carefully remove the **Stereo Slave PCB** by pulling it upwards.

3) Once removed, turn the **Stereo Slave PCB** over.

4) To remove a PCB, use a 5.5mm spanner to remove the relevant M3x4 Taptite Hex Headed Screws that attach the PCBs to the **Master Fader bracket.**

5) To remove a fader, remove the two relevant M3x5 Countersunk Pozi Screws with underhead pips **(H)** as shown in fig.4. Then unplug the fader wireform from the **Stereo Slave PCB**, the fader can now be removed. De-solder the three fader wireform wires from the fader, taking note of the wire positions for refitting.

6) Removal of the 'H' shaped **Control Panel PCB** can only be achieved once the vertical section of PCB has been removed. Once the vertical section has been removed, remove the 2x M3x6mm Pan Pozi Black screws attaching the 'H' shaped **Control Panel PCB** to the fader bracket. The 'H' shaped **Control Panel PCB** can then be removed.

10) To remove the **Mute Group PCB**, use a 5.5mm spanner to remove the two screws attaching the PCB to the fader bracket.

The **VCA Master Slave PCB** must be removed before the **Master Fader PCBs** can be removed.

11) Cut the 2x Cable ties attaching the **VCA Master Slave PCB** onto the **Master Fader PCBs.**

12) Remove the 15way Flexi cable running between the **VCA Master Slave PCB** and the **Mute Group PCB.**

13) Carefully remove the **VCA Master Slave PCB** by pulling it upwards.

14) Once removed, turn the **VCA Master Slave PCB** over.

15) To remove a PCB, use a 5.5mm spanner to remove the relevant M3x4 Taptite Hex Headed Screws that attach the PCBs to the **Master Fader Bracket.**

16) To remove a fader, remove the two relevant M3x5 Countersunk Pozi Screws **(H)** from the Master Fader front panel (see fig.4). Unplug the fader wireform from the **Stereo Slave PCB**, the fader can now be removed. De-solder the three Fader wireform wires from the fader, taking note of the wire positions for refitting.

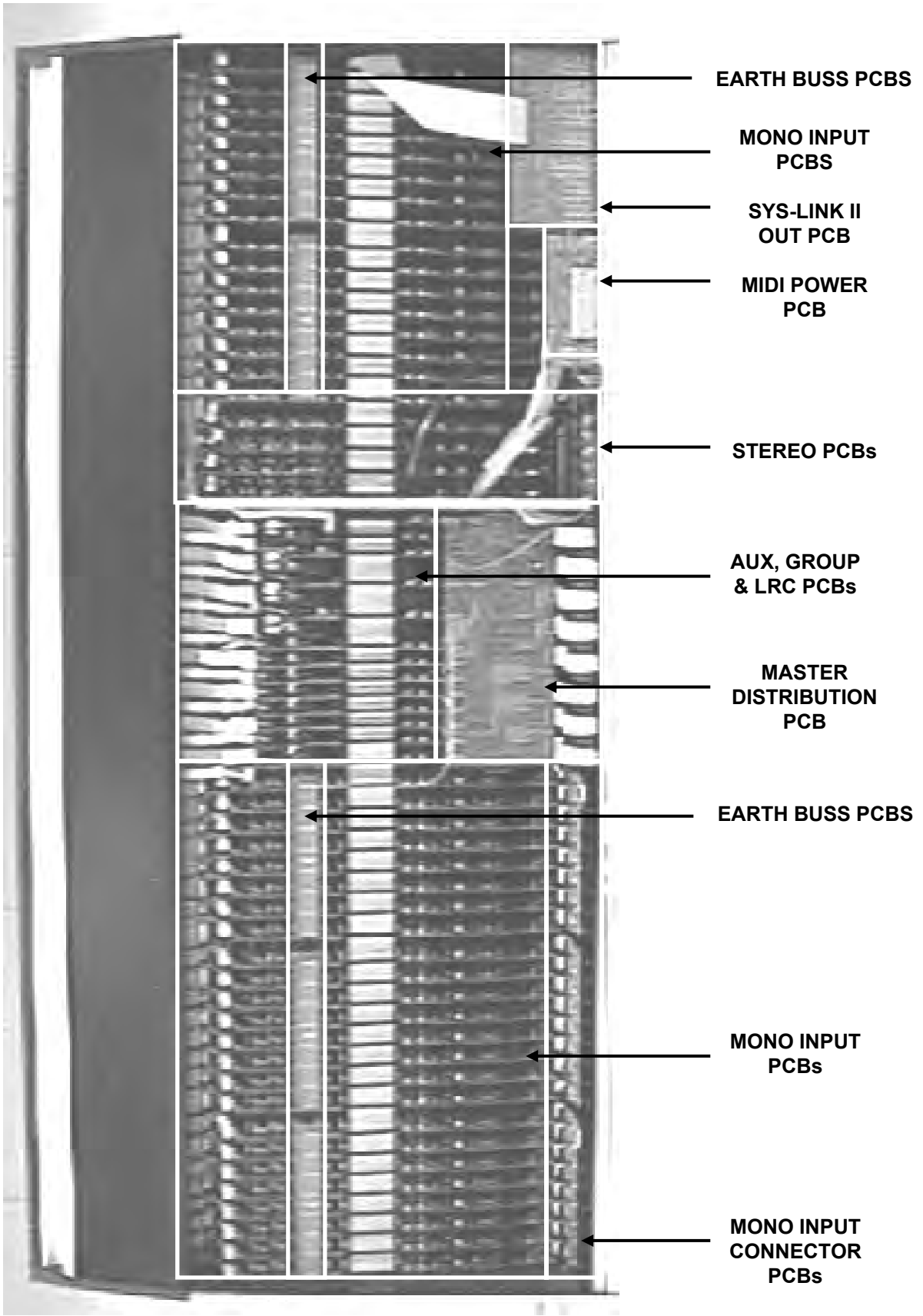
Note: A fader can be removed without removing the IDC wireforms and Slave PCB.

17) To refit any of the PCB assemblies, follow the above procedure in reverse order. **Make sure all harnesses are aligned and plugged on.** Test for correct operation.

Base removal and Internal PCB assemblies

Before beginning any service work, remove all power to the unit and disconnect any signal cables where necessary. Ensure adequate lighting and use the correct tools.

Before you can access the internal PCB assemblies, invert the console and remove the screws securing the base in place. Carefully lift the base off.



Note that the Earth Strip has been removed for clarity.

Removing a Mono Input PCB assembly

Before beginning any service work, remove all power to the unit and disconnect any signal cables where necessary. Ensure adequate lighting and use the correct tools.

1) Remove the screws attaching the relevant Earth Strip running the length of the Mono section (see fig.6, right hand section only shown) then lift away the Earth Strip.

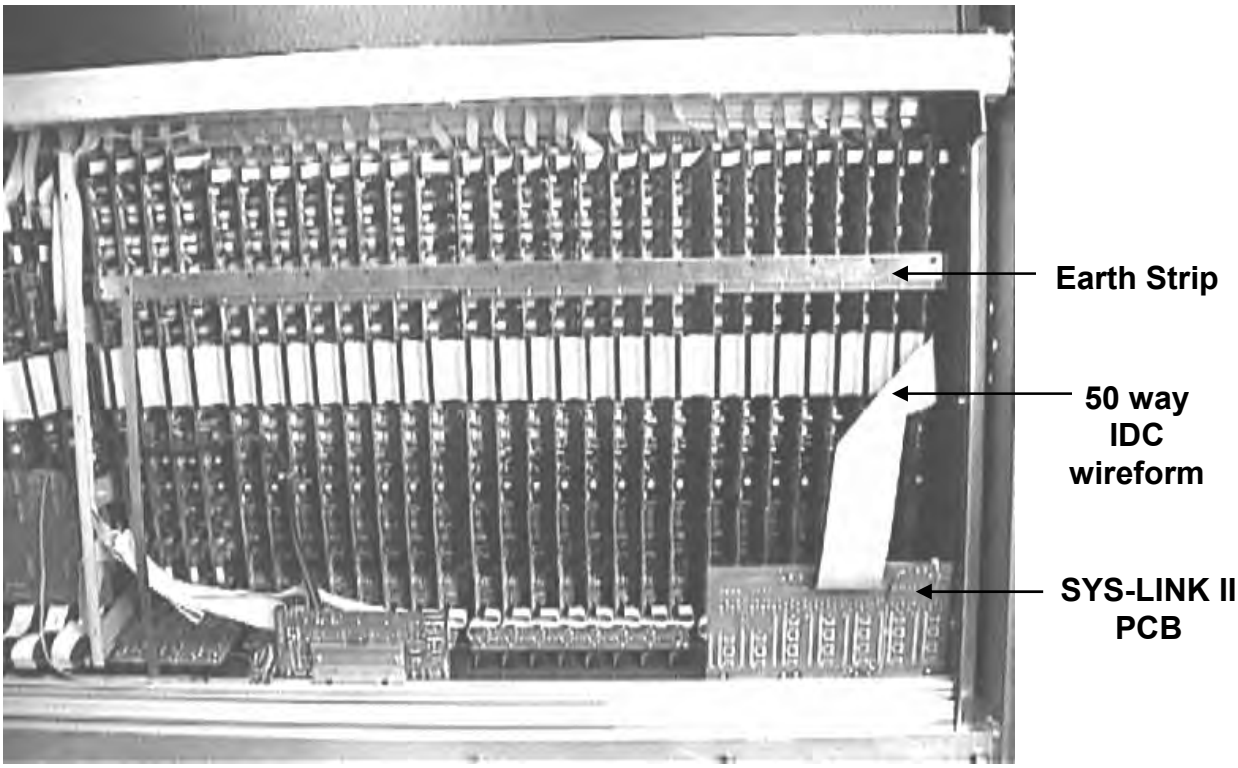


fig.6

2) Carefully detach the 50way IDC wireform from the **Mono Input PCBs** and the **SYS-LINK II Input PCB** as far as the relevant **Mono Input PCB. Note:** There are two different 50way IDC wireforms on either side of the Master section. Remove the relevant IDC wireform according to the side on which the particular **Mono Input PCB** lies.

3) Remove all the knob and switch caps from the required **Mono Input PCB,** then remove the pot nuts underneath using an 11mm nutdriver.

4) The required **Mono Input PCB** can now be removed from the console.

5) To refit a **Mono Input PCB** assembly, follow the above procedure in reverse order. **Make sure all harnesses are correctly aligned and plugged on.** Test for correct operation.

Removing the Master Distribution PCB assembly

To access the Group and Auxiliary PCB assemblies it may be necessary to remove the Master Distribution PCB.

Before beginning any service work, remove all power to the unit and disconnect any signal cables where necessary. Ensure adequate lighting and use the correct tools.

1) Before removing the **Master Distribution PCB** assembly, the console base must first be removed.

2) Locate the **Master Distribution PCB** assembly positioned near the centre of the console (see fig.7).

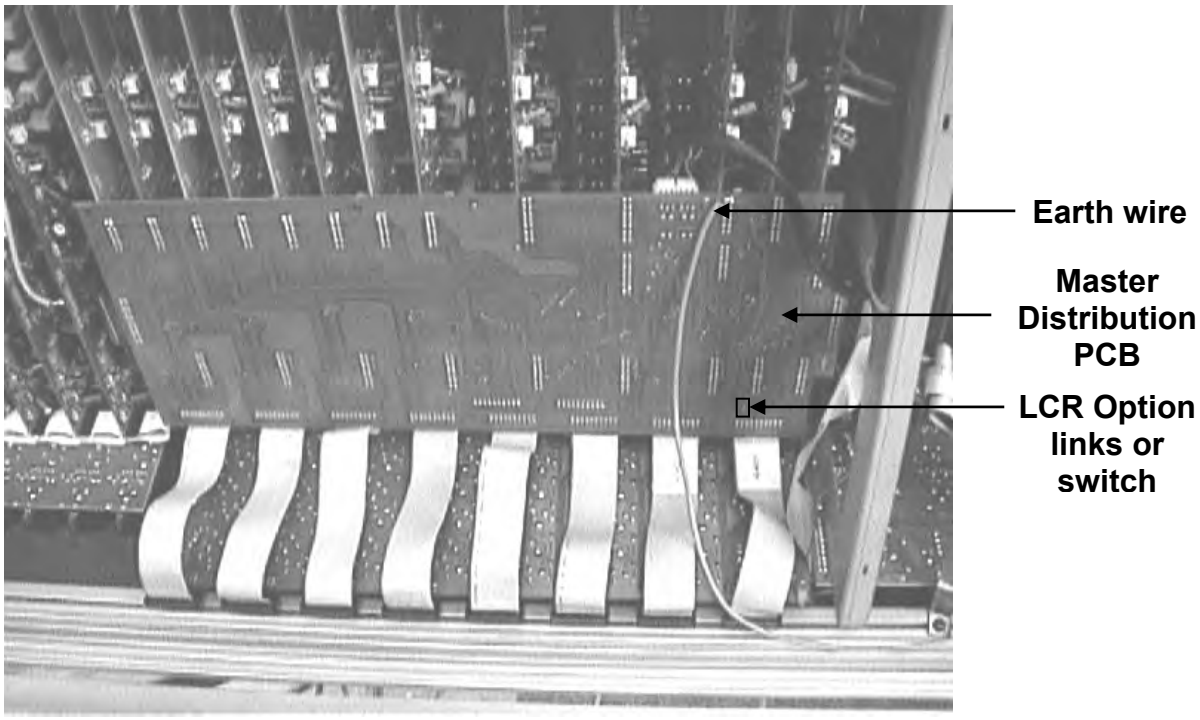


fig.7

3) Unplug all attaching IDC wireforms from the **Master Distribution PCB** assembly.

4) Desolder the Earth wire from the PCB then carefully remove the **Master Distribution PCB** by pulling it away from the console.

5) To refit the **Master Distribution PCB** assembly, follow the above procedure in reverse order. Use an inspection mirror to check that each connector and IDC harness is correctly aligned and plugged on. **Note:** If a switch is fitted to the rear of the **Master Distribution PCB** rather than solder links then make sure that it is set correctly. Test for correct operation.

Servicing the Meterbridge Assembly

Before beginning any service work, remove all power to the unit. Ensure adequate lighting and use the correct tools.

1) Remove all the plastic snap-in rivets along the face of the meter panel with your fingernails or other non-abrasive tool.

2) With a person standing at either end of the console, each using a small, thin screwdriver, place the screwdriver through each of the endmost bottom rivet holes (see fig 8). Raise the meter panel up with the screwdrivers so that the bottom becomes free of the extrusion.

fig.8

3) The complete meter panel assembly can now be removed from the meter pod extrusion by pulling it away from the extrusion, bottom first (see fig.9), allowing access to the Meter PCB assemblies. Remove the two attaching IDC harnesses.

fig.9

Servicing the MPS14 Power Supply

Cleaning and Replacing the fan filters.

At regular intervals, it is recommended that the foam fan filters are cleaned or replaced to ensure efficient operation of the power unit. Failure to do so may reduce the efficiency or even damage the power unit.

To remove the fan filters, switch off and disconnect all power to the MPS14. Remove the rack ears and place to one side. Remove the cover fixing screws and cover and place to one side.

The foam fan filters can now be removed by simply sliding out of the slots.

Either clean or fit new filters depending on their condition.

Replace the filters and reassemble the power unit. Check the fans are running unobstructed before completely re-installing.

Replacing the mains fuse

The AC mains fuse is located on the rear of the MPS14 unit next to the AC mains connector. In the event of a mains surge or under-rated fuse value, the mains input fuse will rupture. Switch off the power supply and remove the mains lead plug from the “MAINS INPUT” socket on the rear of the unit.

Check the fuse and replace if necessary.

TO AVOID THE RISK OF FIRE REPLACE FUSE WITH THE CORRECT TYPE ONLY, AS INDICATED ON THE UNIT

AC~ mains input voltage	Fuse type
100V – 230V ± 10%	T 5A 250V 20mm

In the event of repeated failure of the mains fuse, consult the local dealer from where the unit was purchased.

ORDERING A CONSOLE

To order a new console please specify the model number and AC mains voltage for the Power Supply.

MODEL	DESCRIPTION	ORDER CODE
ML5000-32	32 Mono + 4 Stereo Input Channels	ML5000-32
ML5000-40	40 Mono + 4 Stereo Input Channels	ML5000-40
ML5000-48	48 Mono + 4 Stereo Input Channels	ML5000-48
MPS14	Power Supply for ML5000	MPS14/*

* - Specify the voltage and mains plug requirement for your area.

ORDERING AN ACCESSORY

To order an option please specify the model number required.

MODEL	DESCRIPTION	ORDER CODE
SIDECAR EXPANDER	OPTIONAL 24 MONO INPUT SIDECAR	ML5000-24SC
DC POWER LEAD	2.9 METRE DC POWER LEAD	002-583
DC COMBINER LEAD	0.75 METRE DC COMBINER LEAD	002-584
SYS-LINK CABLE	2.8 METRE 37 WAY AUDIO CABLE	002-617
LOGIC CABLE	2.9 METRE 9 WAY LOGIC CABLE	AL4155
GOOSENECK LAMP	18” GOOSENECK LAMP	AL4061
32 CHANNEL DUSTCOVER	32 CHANNEL VINYL DUSTCOVER	AP4121
40 CHANNEL DUSTCOVER	40 CHANNEL VINYL DUSTCOVER	AP4122
48 CHANNEL DUSTCOVER	48 CHANNEL VINYL DUSTCOVER	AP4123
SIDE-CAR DUSTCOVER	SIDECAR VINYL DUSTCOVER	AP4234

MANUALS AND SUPPORT DOCUMENTATION

MODEL	DESCRIPTION	ORDER CODE
ML5000	User Guide	AP3736
ML5000 SIDECAR	User Guide	AP4124
MPS14 POWER SUPPLY	User Guide	AP3898

SERVICE TOOLS

The tools required to service the ***ML5000*** are standard to an electronics service workshop and are easily obtainable. The following items are necessary for disassembly and service access:

TOOL	USE	ORDER CODE
4mm Hexagon (Allen) key	M6 side trim	AT0033
1-point Crosshead screwdriver	M3, 4AB	AT0004
2-point Crosshead screwdriver	M4, 6AB, 8B	AT0002
11mm AF Nutdriver	Potentiometer and headphone nuts	
12mm Nutdriver	Jack nuts	
1.27mm Hexagon (Allen) key	PSU DC Leads	AT4142
2.5MM hexagon (Allen) key	M4 Sidetrim	
5.5mm AF Spanner	Fader PCB M3 Hex	
5mm Nutspinner	D-Type Screws	

ORDERING AN ASSEMBLY

The following assemblies for the ***ML5000*** are supplied fully tested. Please quote the description and order code for the part required.

Printed circuit board (PCB) assemblies:

DESCRIPTION	ORDER CODE
Mono Input PCB assembly	002-529
Stereo Input PCB assembly	002-564
Group 1, 3, 5, 7 PCB assembly	002-552
Group PCB assembly	002-553
Group 2, 4, 6, 8 PCB assembly	002-554
Aux 10 PCB assembly	002-545
Aux 12 PCB assembly	002-546
Aux 14 PCB assembly	002-547
Aux 16 PCB assembly	002-548
Master Distribution PCB assembly	002-556
LCR Mix PCB assembly	002-544
Mono Fader PCB assembly	002-530
Master Fader Centre PCB assembly	002-589
Master Fader L/R PCB assembly	002-588
Master Fader VCA PCB assembly	002-557
Mute Group PCB assembly	002-563
Control Panel PCB assembly	002-549
Fader Slave PCB assembly	002-551
Stereo Slave PCB assembly	002-566
VCA Master Slave PCB assembly	002-567
Aux Master Slave PCB assembly	002-543
CPU PCB assembly	002-550
Mono Connector PCB assembly	002-560
Stereo LRC Connector PCB assembly	002-565
Master Connector PCB assembly	002-555
MIDI Power PCB assembly	002-575
Sidecar MIDI Power PCB assembly	002-598
SYS-LINK 2 In PCB assembly	002-587
SYS-LINK 2 Out PCB assembly	002-596
Meter 1-8 PCB assembly	002-558
Meter 9-16 PCB assembly	002-591
Meter Master PCB assembly	002-559
Meter Ledbar PCB assembly	002-590

IDC connector harnesses:

DESCRIPTION	ORDER CODE
10 way GRAUX harness	AL4029
10 way Input harness	AL4028
10 way LRC to Fader harness	AL4077
10 way MIDI harness	AL4032
16 way GRAUX harness	AL4030
20 way Master Connector harness	AL4027
20 way Meter harness	AL4021
26 way CPU Power harness	AL4033
26 way LRC Connector harness	AL4031
26 way Distribution harness	AL4020
26 way Slave A harness	AL4022
26 way Slave B harness	AL4023
26 way Slave C harness	AL4024
26 way Slave D harness	AL4025
34 way Master harness	AL4026
Sidecar harness	AL4067
ML5-32 Left harness	AL3964
ML5-32/40 Right harness	AL3967
ML5-40/48 Left harness	AL3834
ML5-48 Right harness	AL3835

THE CHASSIS TRIM

DESCRIPTION	ORDER CODE
ML5000 (all formats) Left & Right Chassis side trims	AA3773-L/R
Left & Right Moulded side trims	AA3781-L/R
Write-on strip 10’	AK0327
Ident strip Master Rear	AK3788
Ident strip Master	AK3833
Ident strip 1-24	AK3789
Ident strip 1-24 Rear	AK3790
Ident strip 25-48	AK3795
Ident strip 25-48 Rear	AK3796

ORDERING AN ML5000 SPARES KIT

It is recommended that the spares kit order code **002-533** is held and maintained by the service agent to enable in-field service repairs to the ***ML5000*** independent of the ALLEN & HEATH factory. Commonly available items such as resistors, capacitors, tools and soldering equipment are not included. The contents of the kit are listed below and are supplied in a cabinet of drawers. Individual spare parts may be ordered. Please quote the description and order code for the part required.

Fixings:

DESCRIPTION	ORDER CODE	QTY
Screw 4AB x 5/16” CSK Pozi Black	AB0059	20
Screw M3 x 8 CSK Pozi Black	AB0074	10
Nylock Nut M3	AB0102	10
Nylock Nut M4	AB0105	10
Screw 4AB x 1/2" Pan Pozi Black	AB0250	10
Screw M6 x 20 CSK Allen Black	AB0310	5
Screw 6B x 3/8 CSK Pozi Zinc	AB2082	20
Screw 8B x 3/8 CSK Pozi Black	AB2085	5
Screw 6B x 5/16 Pan Pozi Black	AB2809	20
Screw 4 x 5/16 Poly Pan Pozi Black	AB2810	20
Screw M3 x 5 CSK Pozi Black	AB2811	20
Screw M3 x 4 TT Hex Head Black	AB3837	20
Screw M6 x 10 CSK Pozi Zinc	AB4036	5
Screw 6B x 3/8 Flange Headed Pozi Black	AB4037	10
Rivet Plastic Snap SR3535B	AB4092	5
Pot Nut 9mm	AB8050	50

Knobs and caps:

DESCRIPTION	ORDER CODE	QTY
Knob Red & Grey 11mm D	AJ2074	10
Knob Blue & Grey 11mm D	AJ2075	40
Knob Light Blue & Grey 11mm D	AJ2076	40
Knob Green & Grey 11mm D	AJ2077	15
Knob Dark Grey & Grey 11mm D	AJ2078	15
Knob Yellow & Grey 11mm D	AJ2079	10
Knob Brown & Grey 11mm D	AJ2080	10
Button 10x5mm Rectangular Grey	AJ2865	2
Button 10x5mm Rectangular Black	AJ3228	1
Fader Knob 11mm Black + White Line	AJ3503	15
Switch Cap Grey 6x6mm Offset	AJ3863	20
Button Illuminated Red	AJ3949	2
Switch Cap White Offset	AJ3950	20

Button 6x6mm Square White	AJ3951	10
Button 6x6mm Square Light Grey	AJ3952	5
Button 6x6mm Square Red	AJ3953	10
Button 6x6mm Square Black	AJ3954	5
Button 8mm Round Light Grey	AJ3955	10
Fader Knob 11mm White+Black Line	AJ8078	10
Fader Knob 11mm Red+Black Line	AJ8079	10
Fader Knob 11mm Yellow+Black Line	AJ8080	5
Fader Knob 11mm Blue+Black Line	AJ8081	10
Button Illuminated White	AJ8107	10

Faders, Potentiometers, Switches and connectors:

Pot 10KC x 2 (103C 14mm wide)	AI0150	3
Pot 20KK (203K 11mm wide)	AI8003	5
Pot 20KB C/D (203B 11mm wide)	AI8004	5
Pot 200KC x 2 (204C 11mm wide)	AI8005	5
Pot 20KB x 2 centre click (14mm wide)	AI8006	5
Pot 20KK x 2 (203K 14mm wide)	AI8007	10
Pot 10KAC x2 (103AC 14mm wide)	AI8008	10
Pot 200KC x 2 (204C 14mm wide)	AI8009	5
Fader 10KSPE 100mm	AI8109	3
Pot 5K (502RD 11mm wide)	AI8111	5
Fader 10KB 100mm	AI8175	10
Fader 10KA 60mm	AI8176	5
Switch 2PCO Latching 90 Deg	AL0162	10
Jack Socket Headphone	AL0328	1
Switch 4PCO Latching	AL0333	15
Switch 2PCO Momentary	AL0374	10
XLR 3 Pin Female Vertical PCB Mount	AL2410	5
XLR 3 Pin Male Vertical PCB Mount	AL2411	5
Switch Slide MINI SPDT PCB	AL3081	1
Jack Socket ¼" Stereo Unswitched	AL3407	20
Jack Socket ¼" Stereo Switched	AL3410	20

LEDs and Semiconductors:

Transistor BC549 NPN	AE0020	5
IC TLO72 Op-Amp	AE0046	10
Transistor J111N FET T092	AE0083	10
LED 3mm T1 Yellow	AE0084	10
LED 3mm T1 Green	AE0085	10
LED 3mm T1 Red	AE0086	10

IC CMOS 4053B	AE0117	10
IC CMOS 4051B	AE0118	1
IC NE5532 Op-Amp	AE0221	10
IC 6N136 Opto-Isolator	AE0222	1
IC TTL 74LSOO	AE0243	1
IC Opto-Isolator 4N35	AE0266	2
IC 7805 Regulator	AE0308	3
IC SSM2018P VCA	AE0315	5
IC RS232 HIN202CP	AE2742	1
IC CMOS 74HC165	AE2749	3
IC CMOS 74HC4094N	AE2755	5
IC Comparator LM393N	AE2818	5
Transistor BC556B PNP	AE3001	5
Crystal 14MHz	AE3007	1
LED Square Red	AE3489	5
LED Square Green	AE3490	10
LED Square Yellow	AE3491	5
Transistor Mosfet BSS138	AE3498	1
IC LA6515 Power Op-Amp	AE3707	3
IC CMOS 74HCT02	AE3988	1
IC SN75176BP Buffer	AE3989	1
LED Rect. Red 5 x 2.5mm	AE4015	3
LED Rect. Yellow 5 x 2.5mm	AE4016	3
LED Rect. Green 5 x 2.5mm	AE4017	3
LED T1 3mm Blue	AE4041	3
Transistor 2SB737 PNP	AE8069	10

Miscellaneous:

Preset 10K Carbon Horizontal Mini	AC0250	5
Preset 470K Carbon Horizontal Adjust	AC4012	5
Meter bulb	AD0013	5
VU Meter + 8V Bulb	AD3321	2
Flex Cable 12 Way 90mm	AH2228	5
Flex Cable 15 Way 90mm	AH4091	3
Battery 2.4V 70mAh NICAD	AP3334	1

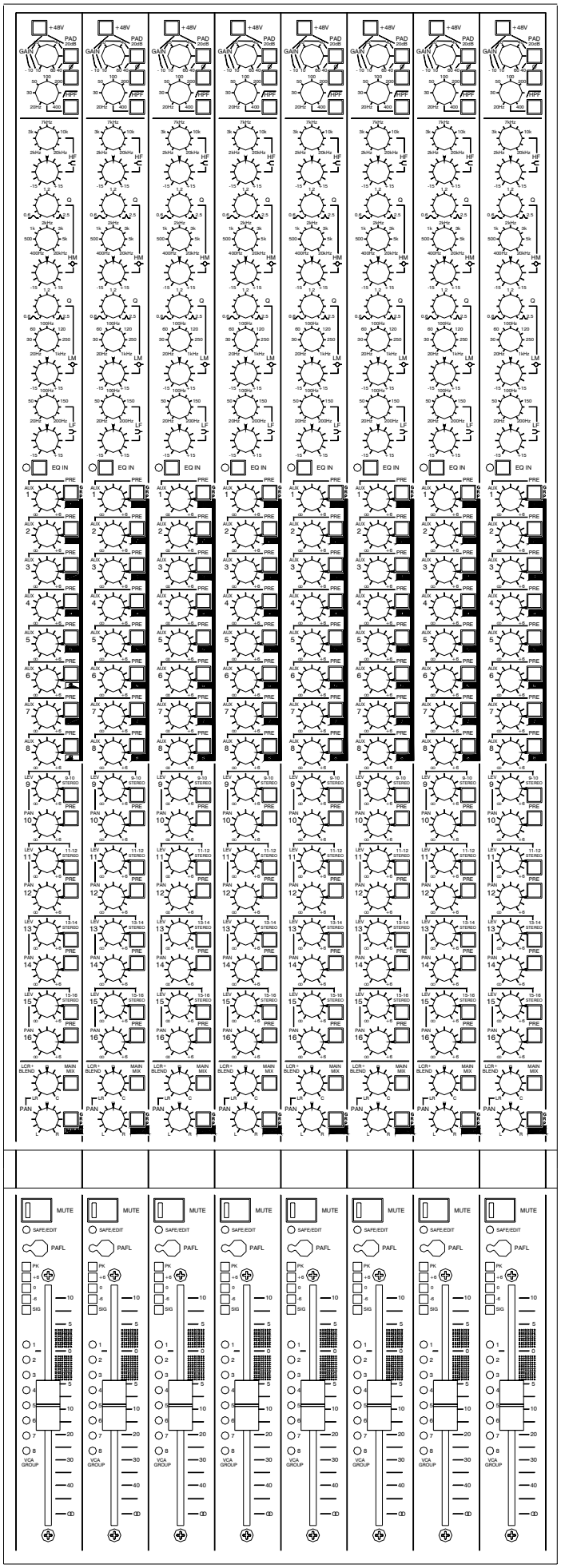
ORDERING AN MPS14 SPARES KIT

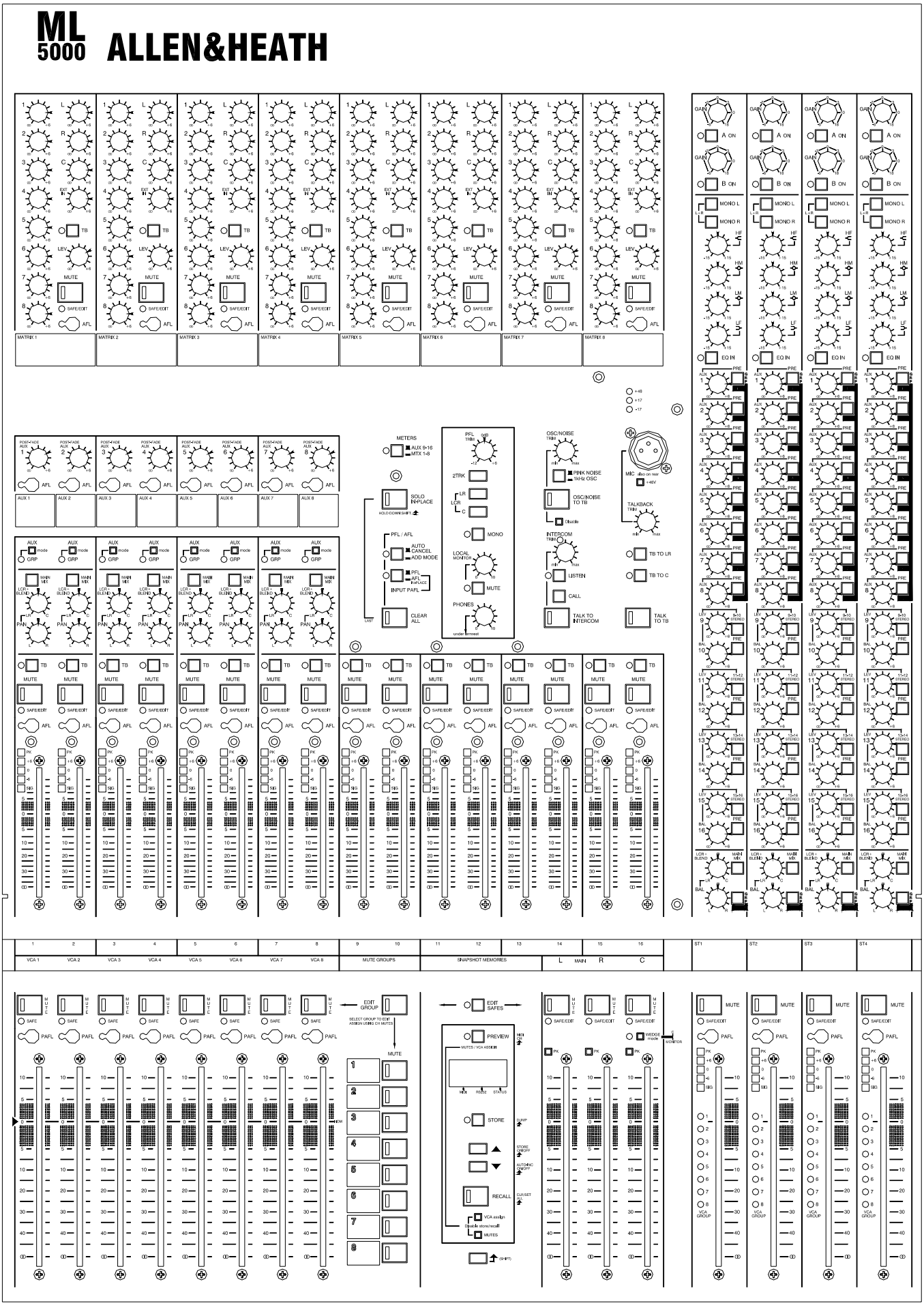
It is recommended that the spares kit order code **002-632** is held and maintained by the service agent to enable in-field service repairs to the ***MPS14*** independent of the ALLEN & HEATH factory. Commonly available items such as resistors, capacitors, tools and soldering equipment are not included. The contents of the kit are listed below and are supplied in a cabinet of drawers. Individual spare parts may be ordered. Please quote the description and order code for the part required.

Power supply:

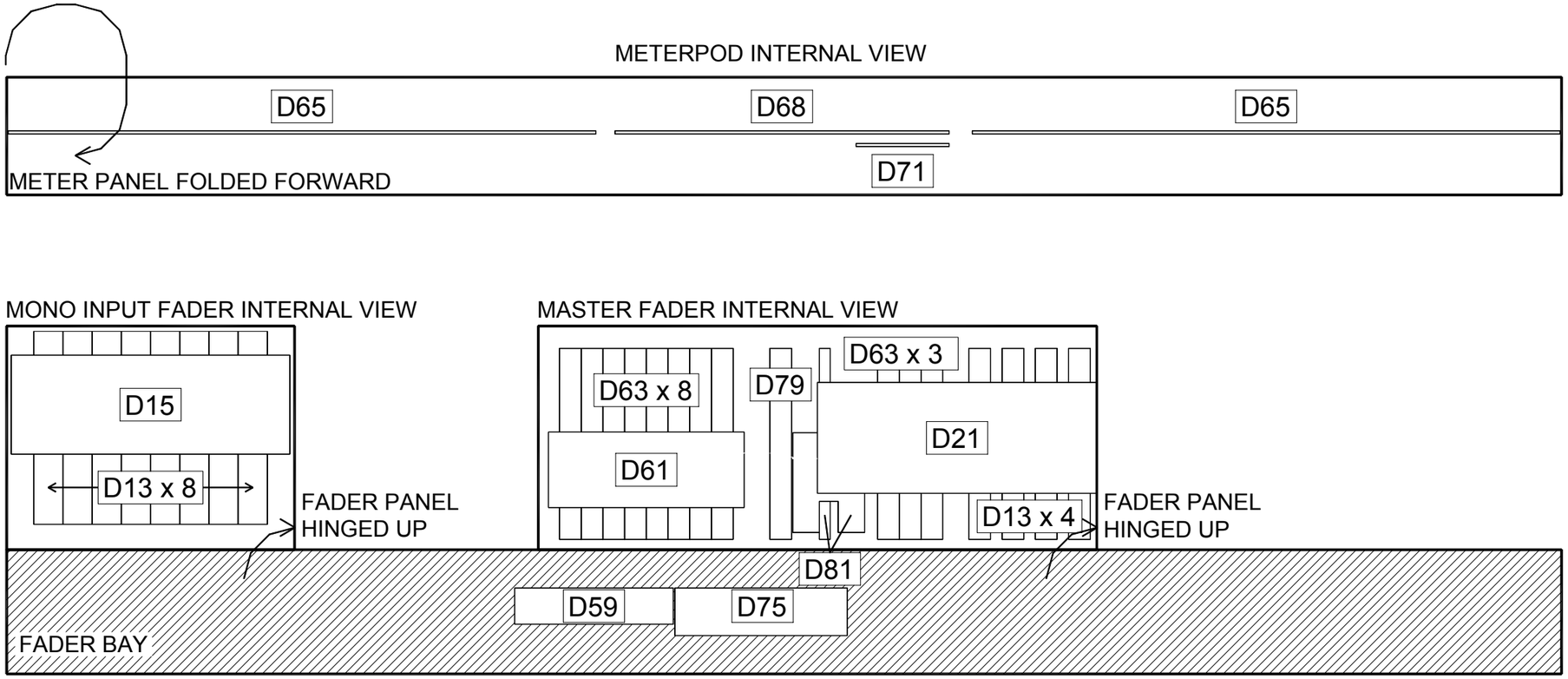
DESCRIPTION	ORDER CODE	QTY
Insulating Kit TO220	AA3514	5
Insulating Pad TDA7294 IC	AA3645	4
Screw M3x 6mm Pan Pozi Black	AB0072	10
Screw M3 x 8mm Pan Pozi Black	AB0073	3
Screw M3 x 10 Pan Pozi Black	AB0076	10
Nylock Nut M3	AB0102	5
Pillar M4 x 10 Nylon Tap	AB0257	3
Screw M4 x 5 Pan Slotted Zinc	AB0261	10
Screw M4 x 8 Countersunk Pozi Black	AB2777	5
Screw 6B x 5/16 Pan Pozi Black	AB2809	10
Screw 4 x 5/16 Poly Pan Pozi Black	AB2810	10
Clip TO220 Type 4426	AB3547	3
Clip TO247 Type MAX03	AB4069	3
Clip TO220 Type MAX10	AB4099	3
Clip TO247 Type 4597	AB4148	3
Res W/Wound 0R33 2.5W 5%	AC3014	3
Preset 1K Carbon Vertical Adjust	AC3958	1
Res Planar 10R 10W	AC4002	2
Zener Diode BZX85 5V6 1.3W	AE0012	3
IC TL072 Dual Op-Amp	AE0046	3
IC 7815 Regulator	AE0047	2
Transistor BC637 NPN TO92H	AE0068	2
IC LM339N Quad Comparator	AE0071	3
IC Adjustable Regulator 783	AE0214	2
IC Op-Amp NE5532N	AE0221	3
Zener Diode BZX55C2V7	AE0231	2
Zener Diode BZX79C 12V 400mW	AE0232	2
IC Regulator 7818	AE3155	2
Diode BYW81P-200 15A	AE3468	2
Diode BYV27-400 2A	AE3469	3
Diode BYV26E 1A 1000V	AE3470	3
Diode P6KE200A	AE3471	3
Transistor Mosfet STP4NA80FP	AE3472	3

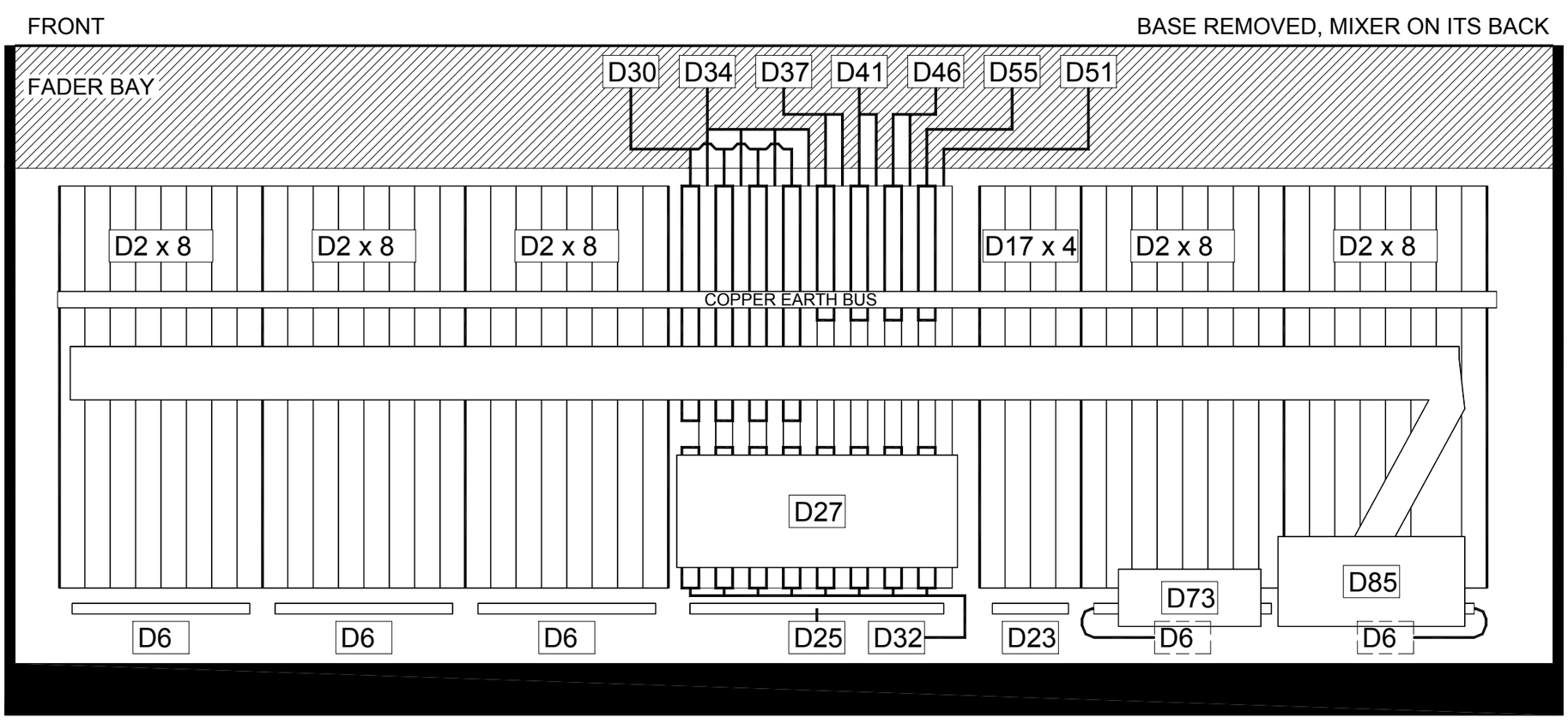
IC SMPS UC3842AN	AE3473	2
Bridge Rectifier 2KBP04M	AE3477	2
Thermistor 100K	AE3499	2
LED Rect. Green 5 x 2mm Flat Top	AE3501	2
LED Rect. Red 5 x 2mm Flat Top	AE3502	3
IC Regulator 7812	AE3588	2
Zener Diode BZV85 20V 1.3W	AE3815	2
Diode 1N5819 1A 40V	AE3914	3
Bridge Rectifier RBV2506	AE3921	2
Transistor Mosfet IRF540N	AE3924	2
Transistor Mosfet IRF9540N	AE3925	2
Transistor Mosfet IRFP450	AE3926	3
Diode RURP3060 30A 600V	AE3933	3
Diode SQ045 8A 45PIV	AE3934	3
Diode SF64 8A 80PIV	AE3935	3
IC SG3525AN PWM Control	AE3938	3
IC UC3854AN PFC Control	AE3939	3
Transistor Mosfet ZVN2106A	AE3940	2
Transistor Mosfet ZVP2106A	AE3941	2
Transistor MPSA92 PNP	AE8119	1
Transistor MPSA42 NPN	AE8138	1
Inrush Supressor	AE8143	1
Fastfoot	AK0102	4
Foam Filter 80 x 80mm	AK4070	3
Fuse 6.3A Anti-Surge 20mm	AL0395	5
Fuse 1.6A Anti-Surge 20mm	AL0466	5
Fuse 5A Anti-Surge 20mm	AL2270	5
Fuse Holder 10A 20mm PCB	AL3447	1
Fuse 500mA Anti-Surge 20mm	AL3534	5
Switch 2PCO Latching Vertical	AL8057	1
Inductor 4.7uH 600mA	AM3467	5
Fan 80x80x25 12V DC	AM3517	1
Inductor Ferrite Sleeve	AM3657	3
Inductor 5MH 5A CMC	AM3900	1
Inductor 330UH 1A	AM3901	1
Inductor 150UH	AM3902	1
Inductor 10UH	AM3903	1
Inductor 1MH	AM3904	1
Transformer HF Pulse PCB	AM4006	1




ML 5000
ALLEN&HEATH
MATRIX 1
MATRIX 2
MATRIX 3
MATRIX 4
MATRIX 5
MATRIX 6
MATRIX 7
MATRIX 8
AUX 1
AUX 2
AUX 3
AUX 4
AUX 5
AUX 6
AUX 7
AUX 8
METERS
AUX 9-16
MTX 1-8
SOLO IN-PLACE
PFL / AFL
AUTO CANCEL ADD MODE
PFL AFL IN-PLACE
INPUT PAFL
CLEAR ALL
PFL TRIM
2TRK
MONO
LOCAL MONITOR
MUTE
PHONES
OSC/NOISE TRIM
PINK NOISE
1kHz OSC
OSC/NOISE TO TB
Disable
INTERCOM TRIM
LISTEN
CALL
TALK TO INTERCOM
MIC
TALKBACK TRIM
TB TO LR
TB TO C
TALK TO TB
VCA 1
VCA 2
VCA 3
VCA 4
VCA 5
VCA 6
VCA 7
VCA 8
MUTE GROUPS
SNAPSHOT MEMORIES
L
MAIN
R
C
ST1
ST2
ST3
ST4
EDIT GROUP
SELECT GROUP TO EDIT, ASSIGN USING CH MUTES
EDIT SAFES
PREVIEW
MUTES / VCA ASSIGN
STORE
RECALL
VCA assign
Disable store/recall
MUTES
(SHIFT)

Service Notes:





Drawing Contents

System Block Diagram D1
Mono Input Channel D2-5
Mono Input Connector D6-7
4M / 4S Connector D8-12
Mono Input Fader D13-14
Mono Input Fader Slave D15-16
Stereo Input Channel D17-20
Stereo Input Fader Slave D21-22
Stereo/LRC Connector D23-24
Master Connector D25-26
Master Distribution D27-29
Group Sub 1 ..... D30-31
Group Sub 2 ..... D32-33
Group 2-8 Master D34-36
Aux 9/10 Master D37-40
Aux 11/12 Master D41-45
Aux 13/14 Master D46-50
Aux 15/16 Master D51-54
LRC Mix Master D55-58
Aux Master Slave D59-60
VCA Master Fader Slave D61-62
Master Fader D63-64
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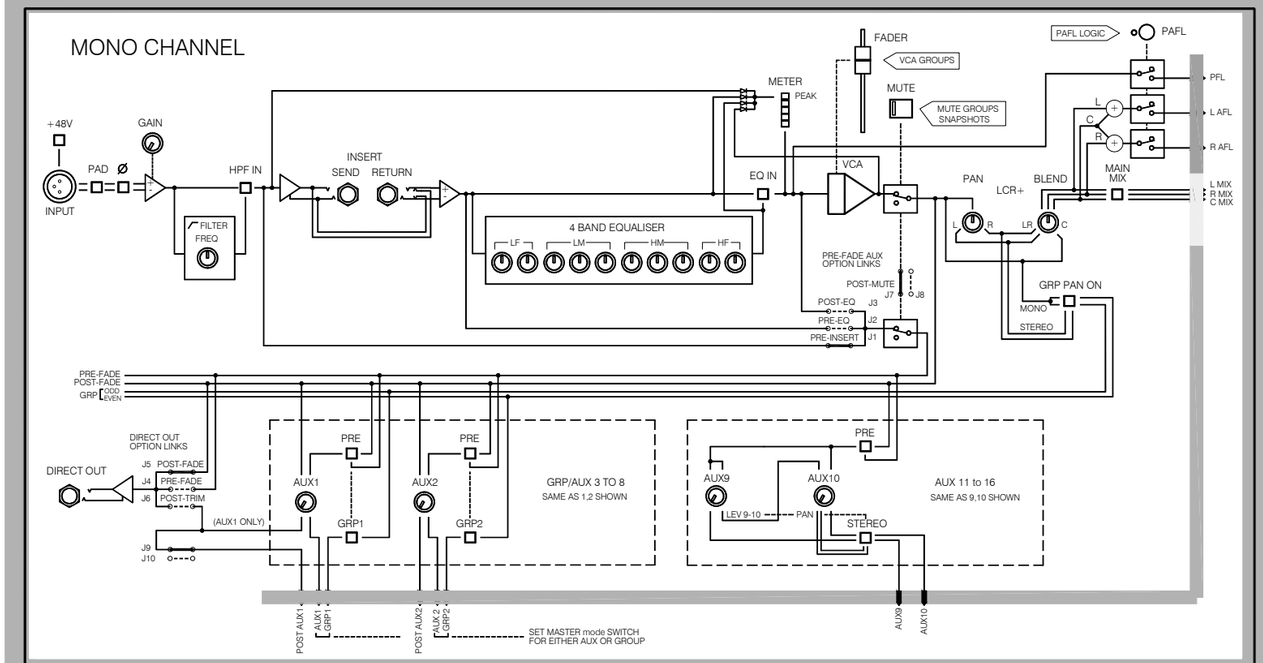
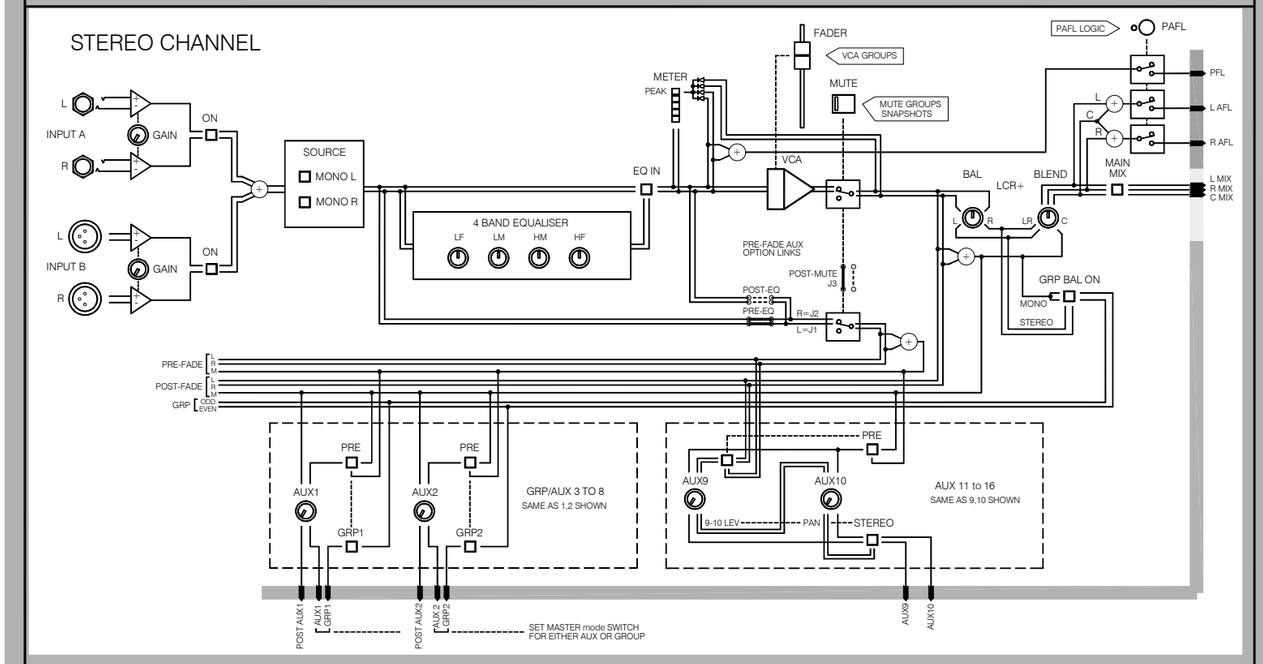
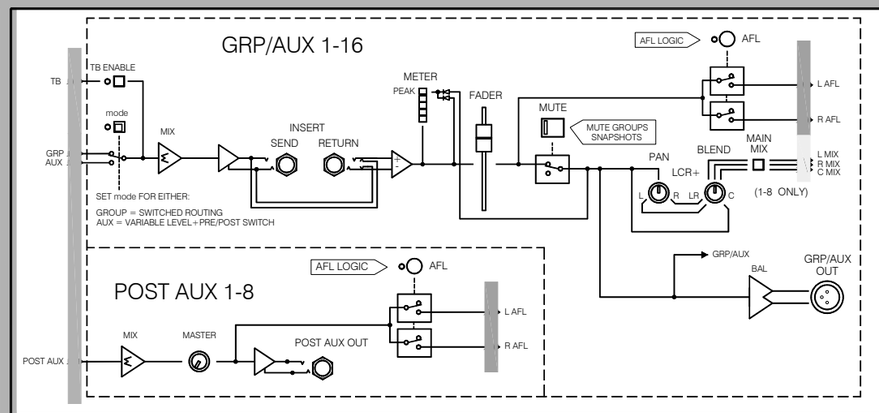
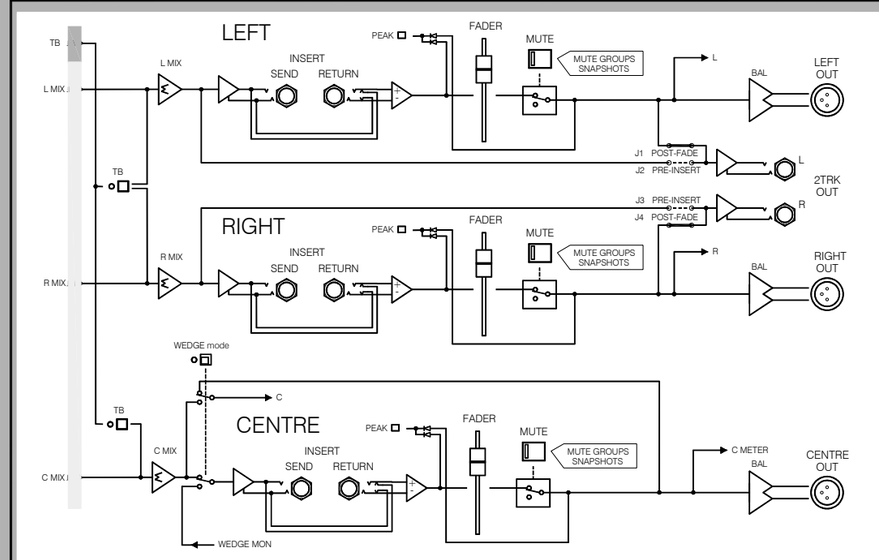
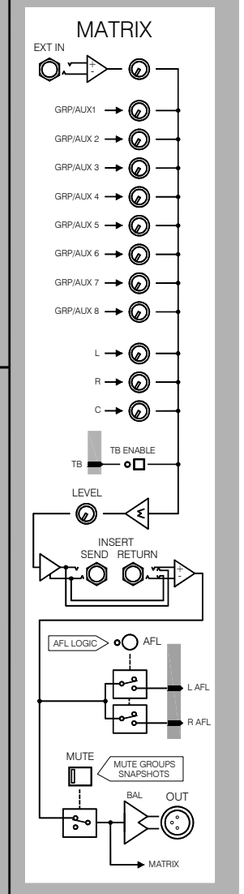
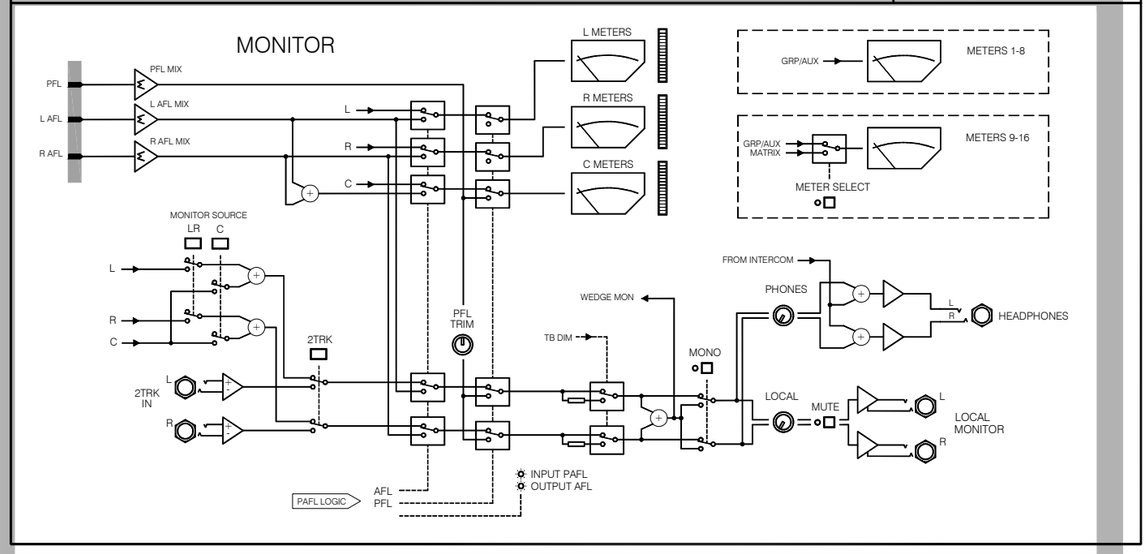

MONO CHANNEL
+48V
GAIN
PAD
Ø
INPUT
HPF IN
FILTER FREQ
INSERT
SEND
RETURN
EQ IN
4 BAND EQUALISER
LF
LM
HM
HF
METER
PEAK
FADER
VCA GROUPS
MUTE
MUTE GROUPS SNAPSHOTS
VCA
PAN
BLEND
LCR+
MAIN MIX
L MIX
R MIX
C MIX
PFL LOGIC
PAFL
PFL
L AFL
R AFL
PRE-FADE AUX OPTION LINKS
POST-MUTE
J7
J8
POST-EQ
J3
PRE-EQ
J2
PRE-INSERT
J1
GRP PAN ON
MONO
STEREO
PRE-FADE
POST-FADE
GRP
ODD
EVEN
DIRECT OUT OPTION LINKS
DIRECT OUT
J5 POST-FADE
J4 PRE-FADE
J6 POST-TRIM
(AUX1 ONLY)
J9
J10
PRE
AUX1
GRP1
AUX2
GRP2
GRP/AUX 3 TO 8
SAME AS 1,2 SHOWN
AUX9
AUX10
LEV 9-10
PAN
STEREO
AUX 11 to 16
SAME AS 9,10 SHOWN
POST AUX1
AUX1 GRP1
POST AUX2
AUX 2 GRP2
SET MASTER mode SWITCH FOR EITHER AUX OR GROUP

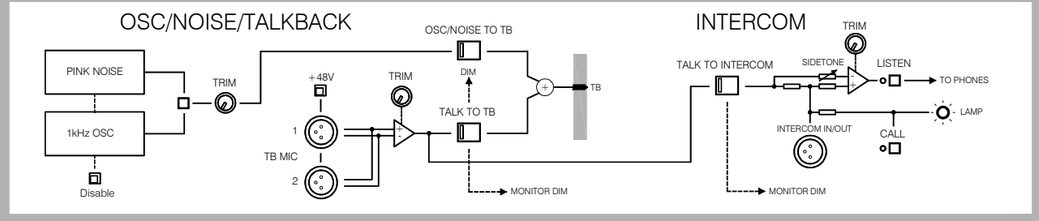

STEREO CHANNEL
L
R
INPUT A
INPUT B
GAIN
ON
SOURCE
MONO L
MONO R
FADER
VCA GROUPS
METER
PEAK
MUTE
MUTE GROUPS SNAPSHOTS
EQ IN
VCA
BAL
LCR+
BLEND
MAIN MIX
4 BAND EQUALISER
LF
LM
HM
HF
PRE-FADE AUX OPTION LINKS
POST-MUTE
J3
POST-EQ
PRE-EQ
R=J2
L=J1
GRP BAL ON
MONO
STEREO
PFL LOGIC
PAFL
PFL
L AFL
R AFL
L MIX
R MIX
C MIX
PRE-FADE
POST-FADE
GRP
ODD
EVEN
PRE
AUX1
GRP1
AUX2
GRP2
GRP/AUX 3 TO 8
SAME AS 1,2 SHOWN
AUX9
AUX10
9-10 LEV
PAN
STEREO
AUX 11 to 16
SAME AS 9,10 SHOWN
POST AUX1
AUX1 GRP1
POST AUX2
AUX 2 GRP2
SET MASTER mode SWITCH FOR EITHER AUX OR GROUP


GRP/AUX 1-16
TB ENABLE
TB
mode
MIX
INSERT
SEND
RETURN
METER
PEAK
FADER
MUTE
MUTE GROUPS SNAPSHOTS
AFL LOGIC
AFL
L AFL
R AFL
MAIN MIX
BLEND
PAN
LCR+
L MIX
R MIX
C MIX
(1-8 ONLY)
GRP/AUX
BAL
GRP/AUX OUT
SET mode FOR EITHER:
GROUP = SWITCHED ROUTING
AUX = VARIABLE LEVEL+PRE/POST SWITCH
POST AUX 1-8
MIX
MASTER
POST AUX OUT

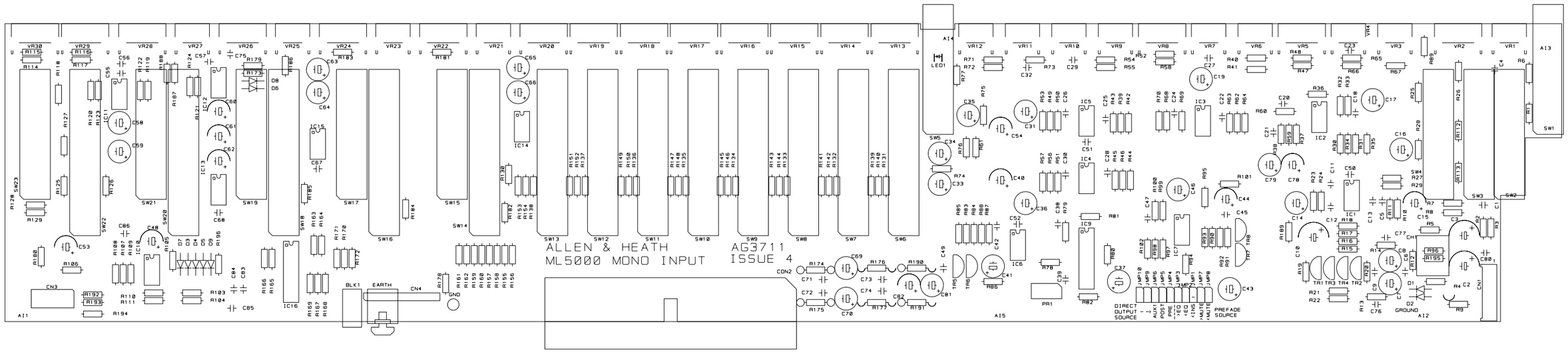

LEFT
TB
L MIX
INSERT
SEND
RETURN
PEAK
FADER
MUTE
MUTE GROUPS SNAPSHOTS
L
BAL
LEFT OUT
J1 POST-FADE
J2 PRE-INSERT
2TRK OUT
RIGHT
R MIX
J3 PRE-INSERT
J4 POST-FADE
R
RIGHT OUT
WEDGE mode
C
CENTRE
C MIX
C METER
CENTRE OUT
WEDGE MON


MATRIX
EXT IN
GRP/AUX1
GRP/AUX 2
GRP/AUX 3
GRP/AUX 4
GRP/AUX 5
GRP/AUX 6
GRP/AUX 7
GRP/AUX 8
L
R
C
TB
TB ENABLE
LEVEL
INSERT
SEND
RETURN
AFL LOGIC
AFL
L AFL
R AFL
MUTE
MUTE GROUPS SNAPSHOTS
BAL
OUT
MATRIX


MONITOR
PFL
L AFL
R AFL
PFL MIX
L AFL MIX
R AFL MIX
L METERS
R METERS
C METERS
GRP/AUX
METERS 1-8
GRP/AUX MATRIX
METERS 9-16
METER SELECT
MONITOR SOURCE
LR
C
2TRK
2TRK IN
PFL TRIM
WEDGE MON
TB DIM
MONO
FROM INTERCOM
PHONES
HEADPHONES
LOCAL
MUTE
LOCAL MONITOR
PAFL LOGIC
AFL
PFL
INPUT PAFL
OUTPUT AFL


OSC/NOISE/TALKBACK
PINK NOISE
1kHz OSC
Disable
TRIM
OSC/NOISE TO TB
DIM
TB
+48V
TB MIC
1
2
TALK TO TB
MONITOR DIM
INTERCOM
TALK TO INTERCOM
SIDETONE
LISTEN
TO PHONES
LAMP
INTERCOM IN/OUT
CALL
MONITOR DIM

D1


ALLEN & HEATH
ML5000 MONO INPUT
AG3711
ISSUE 4
DIRECT OUTPUT SOURCE
PREFADE SOURCE
GROUND
EARTH
BLK1
CN4
CN3
CON2
LED1
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
SW10
SW11
SW12
SW13
SW14
SW15
SW16
SW17
SW18
SW19
SW20
SW21
SW22
SW23
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC10
IC11
IC12
IC13
IC14
IC15
IC16
PR1
A11
A12
A13
A14
A15

D2

DRG NO.	
3711	

INITIAL	ISSUE	DATE
MG	4	10-10-01

CN1
12 WAY FFC
DIR+
DIR-
INSEND+
INSEND-
INSRET+
INSRET-
MIC+
MIC-
CONNECTOR TO REARCON
GROUND
R9 0R
C4 100N 63V
SW1
R6 1K
+48V
48V
R1 1K
C1 100N 63V
R7 8K2
SW2
MIC-
MIC+
C2 47UF 63V
R2 6K8
R3 6K8
C3 47UF 63V
R195 0R
C80 680PF 100V
CH1
R4 47K
R5 47K
R96 0R
C6 330PF 100V
R8 8K2
RANGE
SW3
PHASE
R112 47K
R113 47K
R12 2K2
C8 47UF 25V
D1 1N4148
-VC
C7 47UF 25V
C9 100PF 100V
R13 47K
R14 47K
D2 1N4148
+VC
TR1 2SB737
TR2 2SB737
TR3 BC549
TR4 BC549
C75 330PF 100V
C77 330PF 100V
R15 4K7
R17 10R
R18 10R
VR1 5K RD
R16 4K7
C10 1000UF 6.3V
R19 820R
R20 820R
R21 1K2
R22 1K2
C12 100PF 100V
R24 4K7
C11 100PF 100V
R23 4K7
IC1 NE5532
C14 47UF 25V
R189 100K
R10 1K
R11 3K3
C5 47N 100V
C13 47N 100V
VR2 2X200KC
R25 10K
R29 22K
R27 6K8
R26 10K
R28 10K
C16 47UF 25V
20-400hZ
C18 22PF 100V
R36 68R
PEAK1
R33 10K
R32 10K
C17 47UF 25V
R34 68R
INSEND+
C15 47UF 25V
R30 10K
PRE_INS
R31 10K
INSEND-
R35 68R
+VB
R77 15K
SW5
LED1 GREEN EO IN
-VB
IC1 NE5532
C50 100N 63V
+VA
-VA
IC2 TL072
IC3 TL072
IC4 TL072
IC5 TL072
IC6 TL072
IC7 TL072
C51 100N 63V
C52 100N 63V
PEAK2
R61 68R
C20 15PF 100V
R60 30K
INSRET-
INSRET+
C79 47UF 25V
C78 47UF 25V
R59 30K
R37 10K
R38 10K
C21 47PF 100V
PRE_EQ
VR4 20KB
C22 15PF 100V
R64 22K
R63 10K
R62 10K
R65 15K
C23 2N2 100V
VR3 200KC
R67 22K
R66 8K2
2kHz-20kHz
C19 47UF 25V
VR7 20KB
C25 15PF 100V
R42 10K
R43 10K
R39 3K3
IC5 TL072
C29 22N 100V
R40 6K8
C27 1N5 100V
R41 3K3
C28 1N5 100V
VR6 200KC
IC4 TL072
R44 10K
R45 6K8
R46 39K
VR5 10KAC
R47 10K
R48 820R
VR10 20KB
C26 15PF 100V
R49 10K
R50 10K
R53 3K3
IC5 TL072
C31 220UF 25V
R54 6K8
R55 6K8
C30 22N 100V
VR9 200KC
IC4 TL072
R51 10K
R56 6K8
R57 82K
VR8 10KAC
R52 10K
R58 1K
VR12 20KB
PEAK3
C24 15PF 100V
R70 27K
R69 10K
R68 10K
IC3 TL072
C34 220UF 25V
R75 100K
C33 220UF 25V
R74 100K
VR11 200KC
R73 22K
C32 6N8 100V
R71 15K
R72 8K2
20-200Hz
C35 220UF 25V
POST_EQ
R76 100K
PEAK4
R81 150K
C40 47UF 25V
R83 5K6
R84 5K6
R88 10K
C42 22PF 100V
C41 47UF 25V
R87 10K
R86 150K
IC6 TL072
POSTFADE
R85 6K8
TR5 J111
TR6 J111
DEFAULT
JMP1
PRE_INS
JMP2
PRE_EQ
JMP3
POST_EQ
JMP7
JMP8
-VA
C43 47UF 25V
R90 5K6
R92 6K8
TR7 J111
R91 5K6
TR8 J111
R94 10K
C45 22PF 100V
C44 47UF 25V
R93 10K
R95 150K
IC7 TL072
PREFADE
DEFAULT
JMP5
POST
JMP4
PRE
AUX 1
JMP6
A1_OPTION
DIRECT OUTPUT
R100 10K
C47 22PF 100V
R99 10K
R97 10K
C46 47UF 25V
R101 68R
DIR+
R98 10K
DIR-
R102 68R
IC7 TL072
PR1 470K
R80 470K
C38 22PF 100V
R79 18K
+VA
IC9 SSM2018
+I1-G V1-G
+VCC Bal
-IG VG
-I1-IG GND
C1 Mode
+IN Vc
-IN -Vee
C2 C3
C36 47UF 25V
R78 18K
C39 100PF 100V
-VA
R82 10K
VC
C37 1UF 50V
MUTE
+VB
R109 1M
R108 10K
R107 100K
R111 470K
C49 100N 63V
R110 10K
IC10 LM393
-VB
PEAK1
PEAK2
PEAK3
PEAK4
D3 1N4148
D4 1N4148
D5 1N4148
D9 1N4148
R196 1M
D7 1N4148
R105 100K
R106 100K
PEAK
C48 10UF 50V
R103 30K
R104 22K
D3

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NOTES

VR1 5K RD
VR2 2X200KC
VR4 20KB
VR3 200KC
VR5 10KAC
VR6 200KC
VR7 20KB
VR8 10KAC
VR9 200KC
VR10 20KB
VR11 200KC
VR12 20KB

POT BRACKETS CONNECTED
TO ENFORCE CONNECTION
TO FRONT PANEL FOR
HUM SHIELDING

DRN. MG

ALLEN & HEATH
KERNICK INDUSTRIAL EST
PENRYN
CORNWALL
TR10 9LU
TEL: 01326 372070
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TITLE
ML5000 MONO INPUT

DRG NO.
3711

SHT. 1 OF

DRG NO.	3711

INITIAL	ISSUE	DATE
MG	4	10-10-01

POSTFADE
C54 220UF 25V
VR30 10KAC
R114 22K
R115 22K
PAN_R
PAN_L
R116 10K
R117 10K
R118 10K
VR29 2X20KB
C55 22PF 100V
R122 5K6
R119 2K7
IC11 TL072
C58 47UF 25V
AFL1
R125 3K9
SW22
MIX_R
C56 22PF 100V
R123 5K6
R120 2K7
IC11 TL072
C59 47UF 25V
AFL2
R126 3K9
MIX_L
C57 22PF 100V
R124 5K6
R121 2K7
IC12 TL072
C60 47UF 25V
AFL3
R127 3K9
MIX_C

POST_EQ
C75 100N 63V
R179 180K
R173 680K
D6 1N4148
IC12 TL072
D8 1N4148
R180 4K7
NOT FITTED
C53 330N
C86 330NF
METER
LG

IC14 NE5532
IC15 NE5532
IC11 TL072
IC12 TL072
IC13 TL072
+VA
-VA
C67 100N 63V
C68 100N 63V

POSTFADE
PREFADE
C63 220UF 25V
C64 220UF 25V
IC15 NE5532

PFL_ON
IC16 4053
R163 22K
R164 22K
PFL_BUS
AFL_ON
AFL1
AFL3
AFL2
R165 22K
R166 22K
R167 22K
R168 22K
R169 22K
AFLL_BUS
R170 3K3
R171 3K3
R172 6K8
VCC
VEE
GND
INH

SW15
SW14
VR21 20KK
VR22 20KBX2
R181 10K
R182 10K
R155 10K
AUX_10
R156 10K
AUX_9
SW17
SW16
VR23 20KK
VR24 20KBX2
R183 10K
R184 10K
R157 10K
AUX_12
R158 10K
AUX_11
SW19
SW18
VR25 20KK
VR26 20KBX2
R185 10K
R186 10K
R159 10K
AUX_14
SW21
SW20
VR27 20KK
VR28 20KBX2
R187 10K
R188 10K
R160 10K
AUX_13
R161 10K
AUX_16
R162 10K
AUX_15

SW23
IC13 TL072
PAN_L
R128 100K
C61 220UF 25V
MAX LOAD=2K2
R131 10K
SW6
GRP1
PAN_R
R129 100K
C62 220UF 25V
R132 10K
SW7
GRP2
R133 10K
SW8
GRP3
R134 10K
SW9
GRP4
R135 10K
SW10
GRP5
R136 10K
SW11
GRP6
R137 10K
SW12
GRP7
R138 10K
SW13
GRP8

C65 220UF 25V
IC14 NE5532
POSTFADE_1
C66 220UF 25V
IC14 NE5532
PREFADE
R130 100K
PREFADE_1

POSTFADE_1
PREFADE_1
A1_OPTION
JMP9
JMP10
VR13 2X20KK
R139 10K
P/PAUX1
R140 10K
POAUX1
VR14 2X20KK
R141 10K
P/PAUX2
R142 10K
POAUX2
VR15 2X20KK
R143 10K
P/PAUX3
R144 10K
POAUX3
VR16 2X20KK
R145 10K
P/PAUX4
R146 10K
POAUX4
VR17 2X20KK
R147 10K
P/PAUX5
R148 10K
POAUX5
VR18 2X20KK
R149 10K
P/PAUX6
R150 10K
POAUX6
VR19 2X20KK
R151 10K
P/PAUX7
R152 10K
POAUX7
VR20 2X20KK
R153 10K
P/PAUX8
R154 10K
POAUX8

D4

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NOTES

VR13 2X20KK
VR14 2X20KK
VR15 2X20KK
VR16 2X20KK
VR17 2X20KK
VR18 2X20KK
VR19 2X20KK
VR20 2X20KK
VR21 20KK
VR23 20KK
VR25 20KK
VR27 20KK
VR22 20KBX2
VR24 20KBX2
VR26 20KBX2
VR28 20KBX2
VR29 2X20KB
VR30 10KAC

DRN. MG

ALLEN & HEATH
KERNICK INDUSTRIAL EST
PENRYN
CORNWALL
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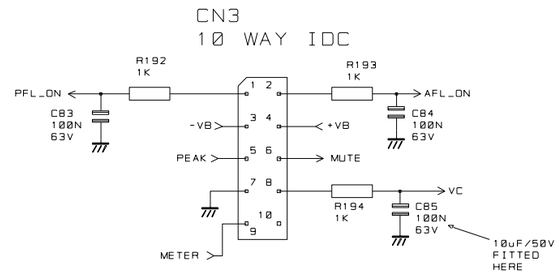
TITLE
ML5000
MONO INPUT

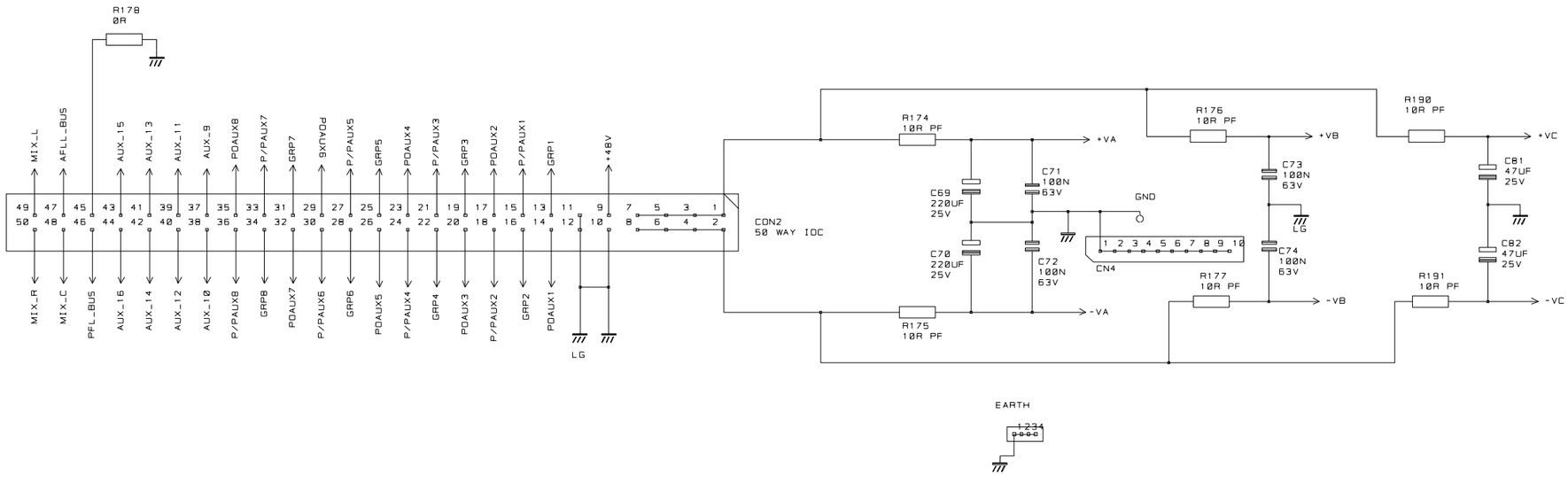
DRG NO. 3711

SHT. 1 OF 1

DRG NO.	3711

INITIAL	ISSUE	DATE
MG	4	10-10-01





D5

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NOTES

DRN. MG

ALLEN & HEATH

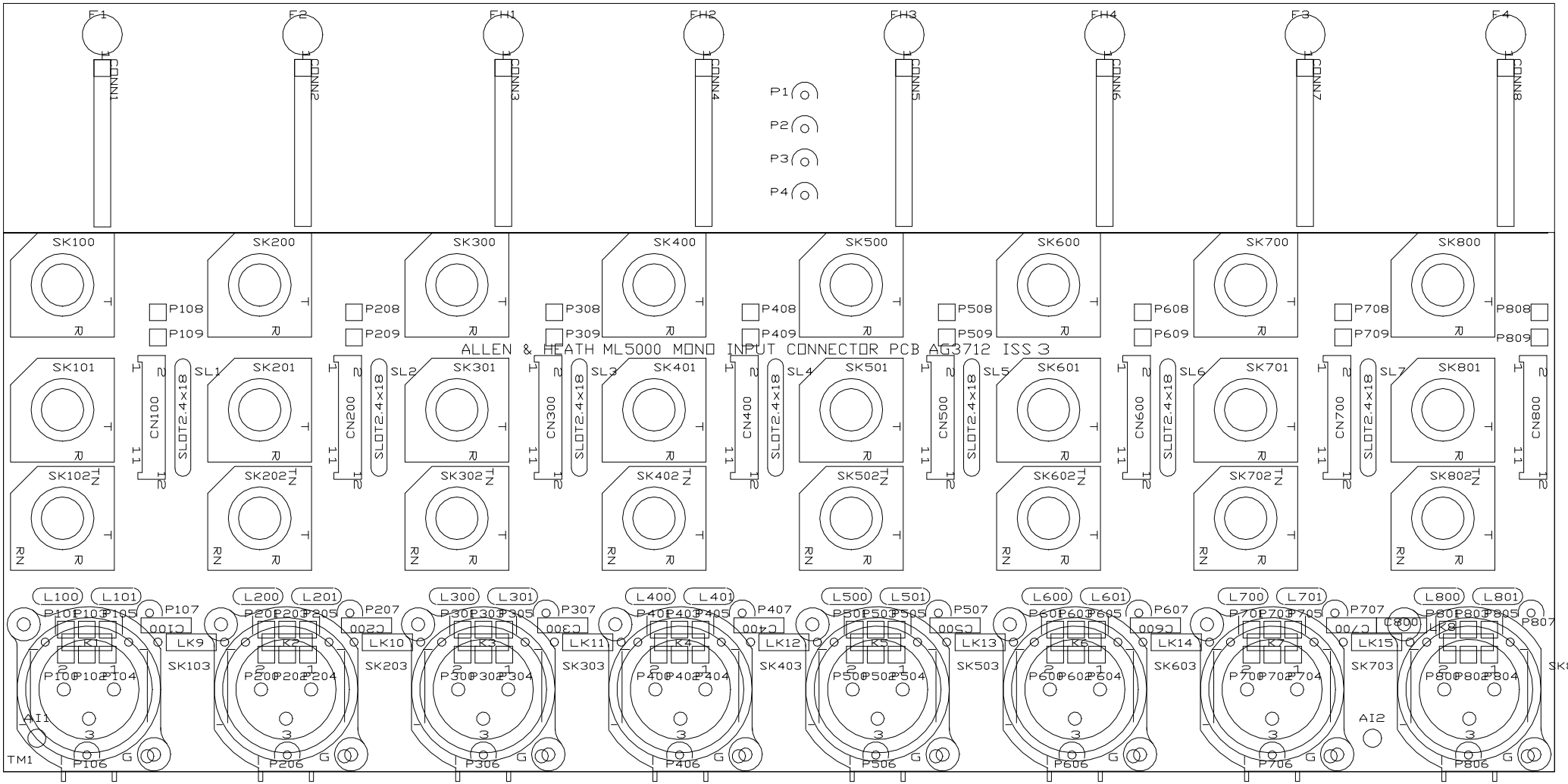
KERNICK INDUSTRIAL EST
PENRYN
CORNWALL
TR10 9LU

TEL: 01326 372070
FAX: 01326 377097

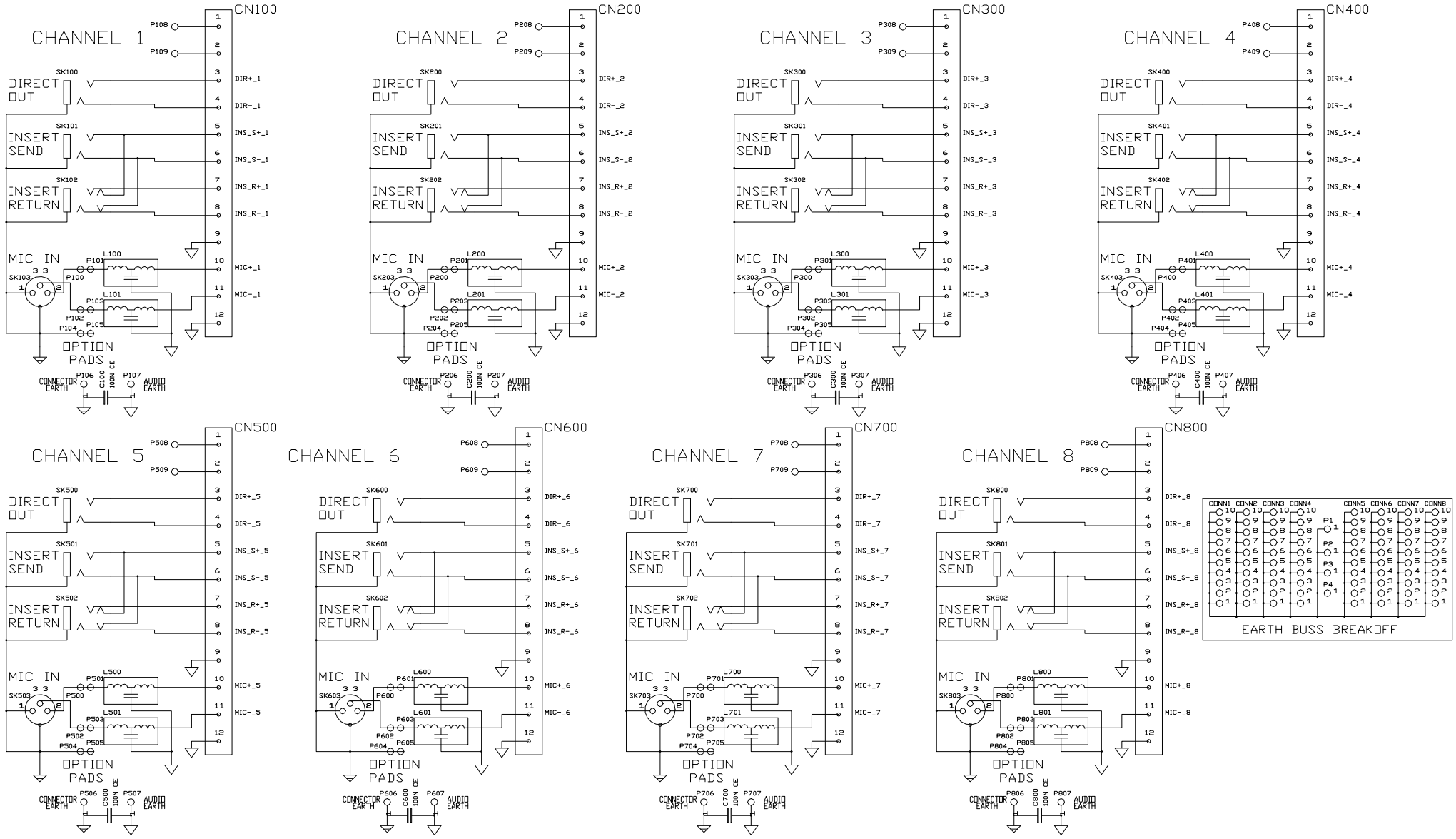
TITLE
ML5000
MONO INPUT

DRG NO.
3711

SHT. 1 OF 1


F1
F2
FH1
FH2
FH3
FH4
F3
F4
CONN1
CONN2
CONN3
CONN4
CONN5
CONN6
CONN7
CONN8
P1
P2
P3
P4
SK100
SK200
SK300
SK400
SK500
SK600
SK700
SK800
SK101
SK201
SK301
SK401
SK501
SK601
SK701
SK801
SK102
SK202
SK302
SK402
SK502
SK602
SK702
SK802
P108
P109
P208
P209
P308
P309
P408
P409
P508
P509
P608
P609
P708
P709
P808
P809
SL1
SL2
SL3
SL4
SL5
SL6
SL7
CN100
CN200
CN300
CN400
CN500
CN600
CN700
CN800
SLOT2.4x18
ALLEN & HEATH ML5000 MONO INPUT CONNECTOR PCB AG3712 ISS 3
L100
L101
L200
L201
L300
L301
L400
L401
L500
L501
L600
L601
L700
L701
L800
L801
P107
P207
P307
P407
P507
P607
P707
P807
C100
C200
C300
C400
C500
C600
C700
C800
LK9
LK10
LK11
LK12
LK13
LK14
LK15
LK8
K1
K2
K3
K4
K5
K6
K7
K8
SK103
SK203
SK303
SK403
SK503
SK603
SK703
SK803
AI1
AI2
TM1

D6



D7

ISS.	REVISION	BY DATE
A	ORIGIN	AAT05-07-99
1	100N CAPS ADDED	AAT14-12-99
2	EARTH BUSS ADDED	AAT10-04-00
3	CLINCH SHORT PREVENTION	AAT28-06-00

NOTES

1. RESISTORS MARKED * ARE 1%
   ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE MARKED
2. ELECTROLYTIC CAPACITORS ARE ?F/VOLTS

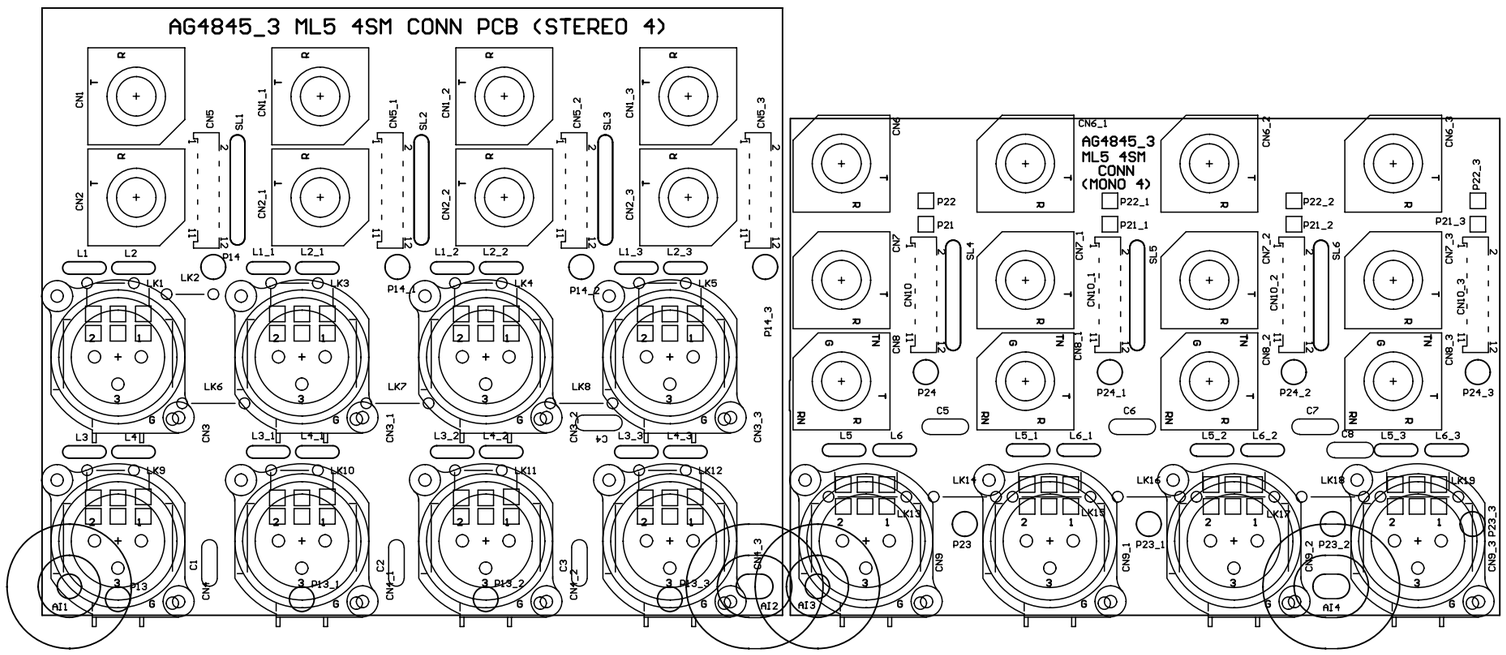
UNIT TITLE: ML5000

DRAWING TITLE: MONO INPUT CONNECTOR

PCB TYPE AG3712

ALLEN & HEATH
KERNICK INDUSTRIAL ESTATE
PENRYN
CORNWALL
ENGLAND TR10 9LU
TEL. (44) (0) 1326 372070
FAX. (44) (0) 1326 377097

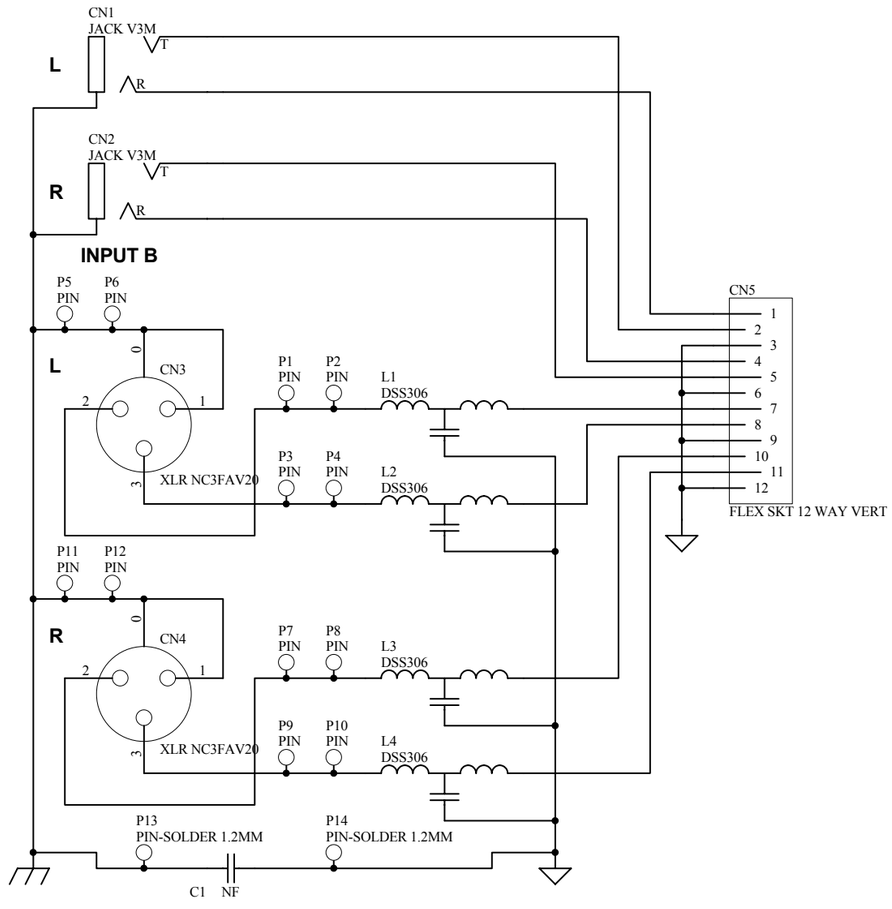
DRAWING No. C3712 ISSUE 3 A2



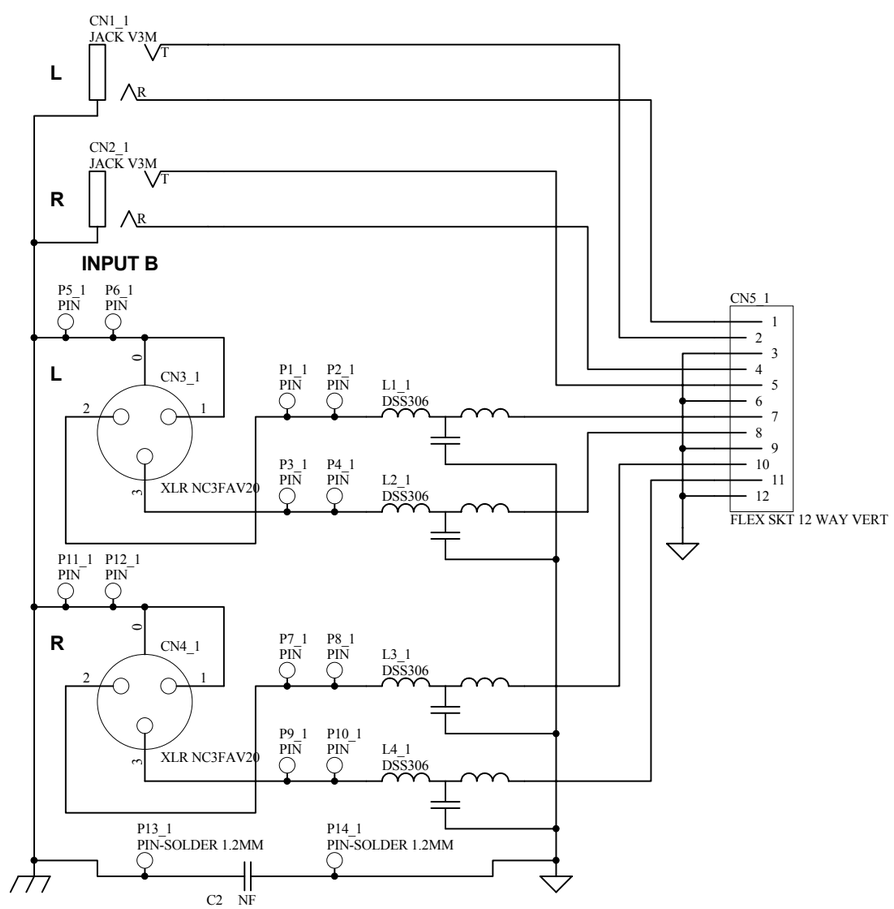
D8

ALLEN&HEATH Kernick Industrial Estate, Penryn, Cornwall, England.TR10 9LU Tel: +44 (0)8707 556250 Fax: +44 (0)8707 556251	TOP OVERLAY .GTO	TITLE: ML5000 4SM CONN PCB
	FILE: AG4845_3.PCB PRINTED: 10:31:44 3-Dec-2002	DRG No: AG4845 ISSUE: 3

STEREO 1



STEREO 2



D9

ALLEN&HEATH
Kernick Industrial Estate,
Penryn, Cornwall,
England. TR10 9LU
Tel: +44 (0)8707 556250
Fax: +44 (0)8707 556251

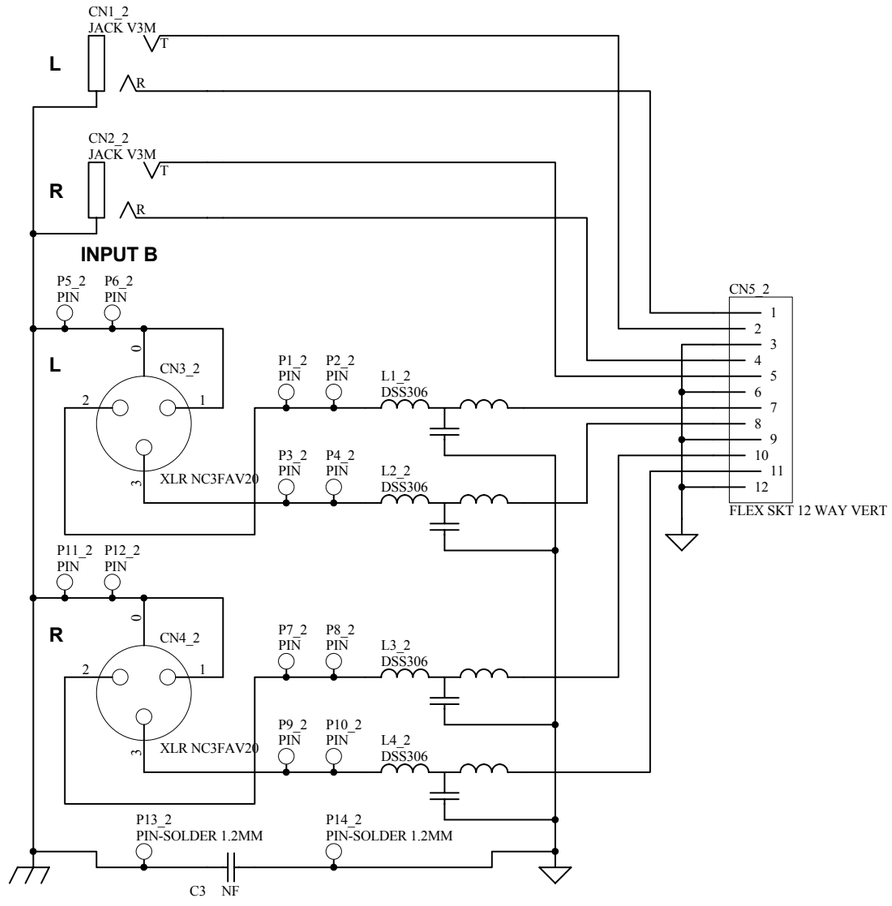
ISSUE	BY	DATE
2	AAT	18-04-02
3	AAT	02-05-02

FILE: C4845_3P2.Sch | PRINTED: 10:38:56 3-Dec-2002

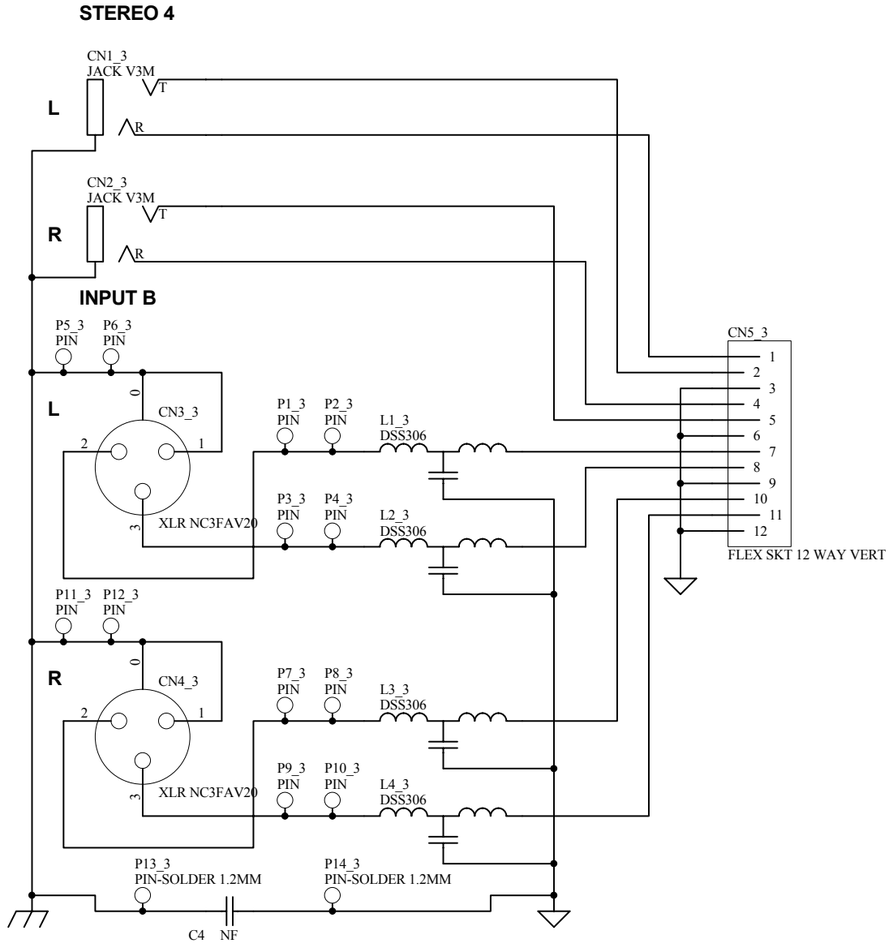
TITLE: ML5000 4SM CONN PCB
PAGE:

DRG No: C4845 ISSUE: 3 SHEET: 2 OF 5

STEREO 3



STEREO 4



D10

ALLEN&HEATH
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Penryn, Cornwall,
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Fax: +44 (0)8707 556251

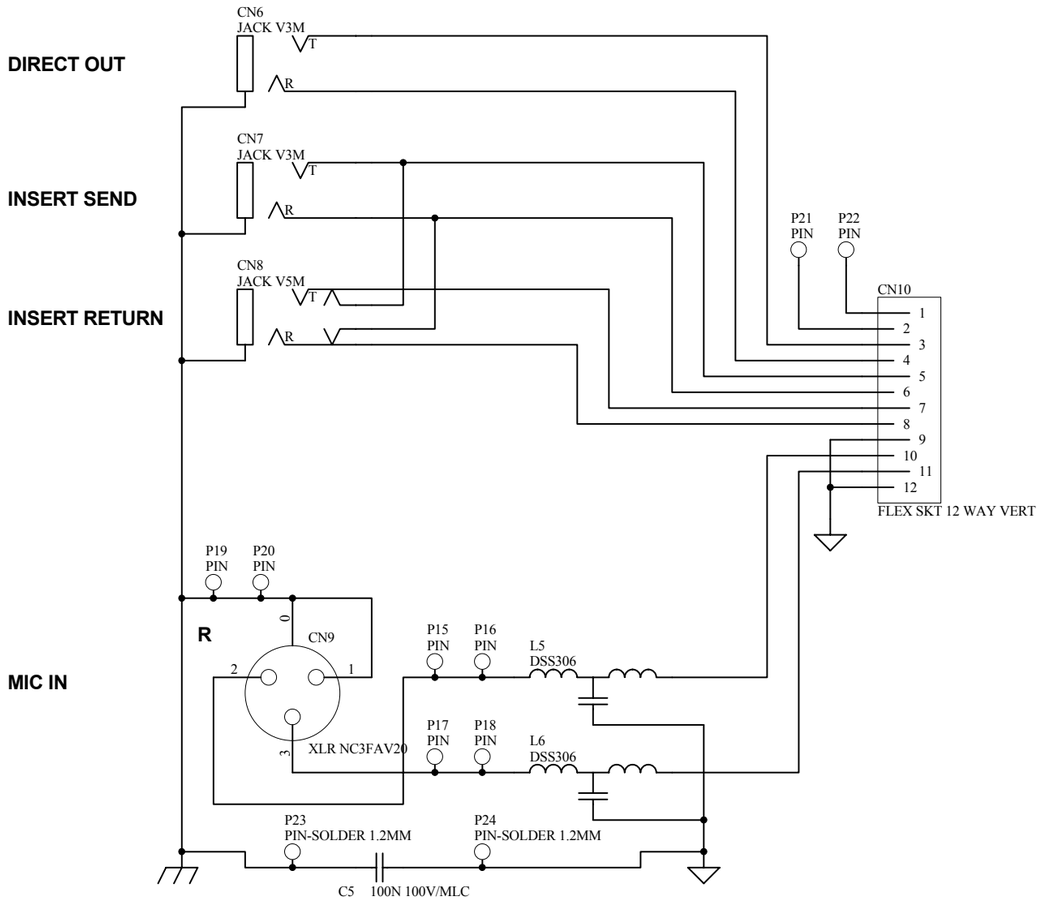
ISSUE	BY	DATE
2	AAT	18-04-02
3	AAT	02-05-02

FILE: C4845_3P3.Sch | PRINTED: 10:38:57 3-Dec-2002

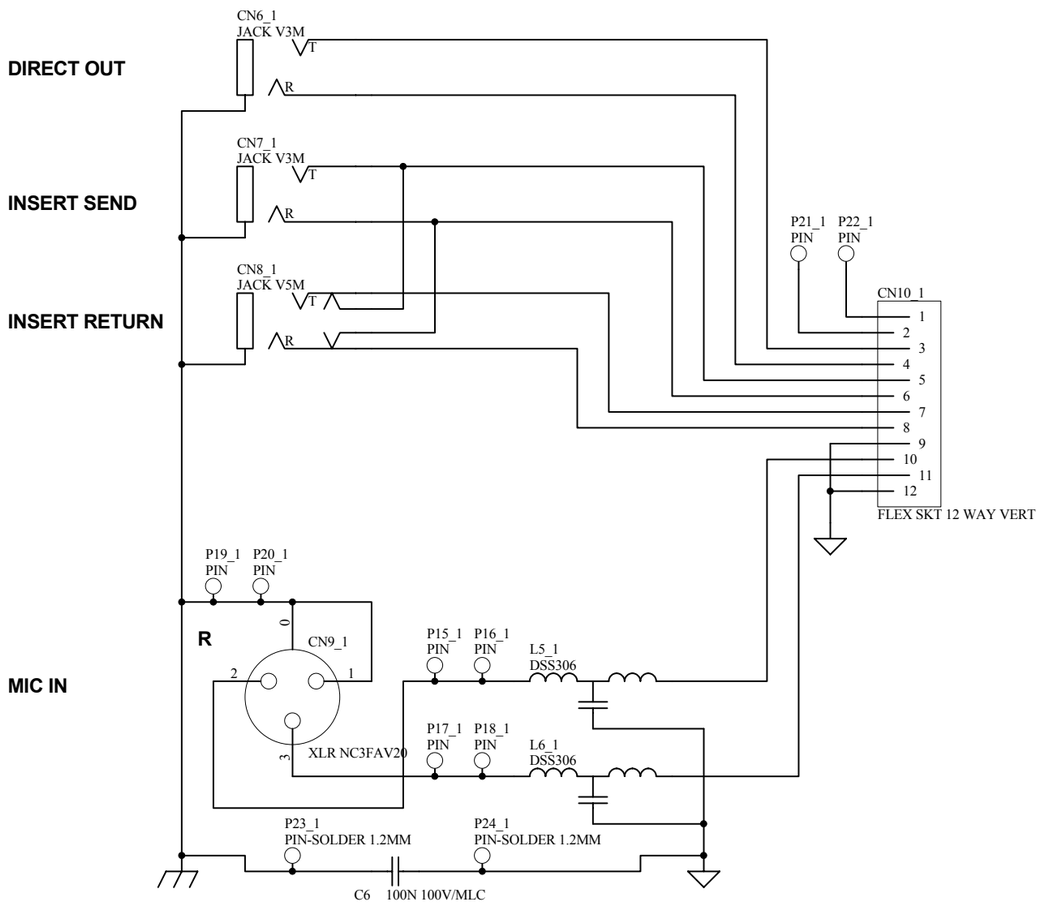
TITLE: ML5000 4SM CONN PCB
PAGE:

DRG No: C4845 ISSUE: 3 SHEET: 3 OF 5

MONO 1



MONO 2



D11

ALLEN&HEATH
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Penryn, Cornwall,
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Tel: +44 (0)8707 556250
Fax: +44 (0)8707 556251

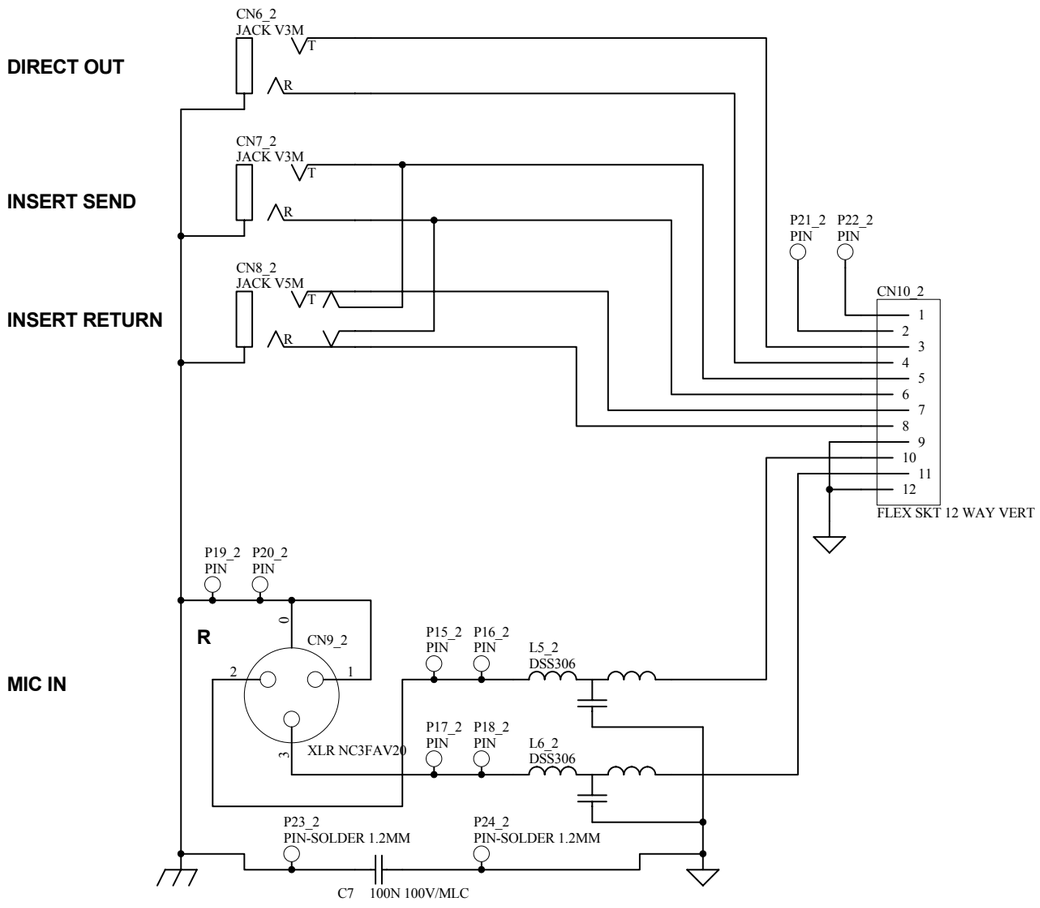
ISSUE	BY	DATE
2	AAT	18-04-02
3	AAT	02-05-02

FILE: C4845_3P4.Sch | PRINTED: 10:38:57 3-Dec-2002

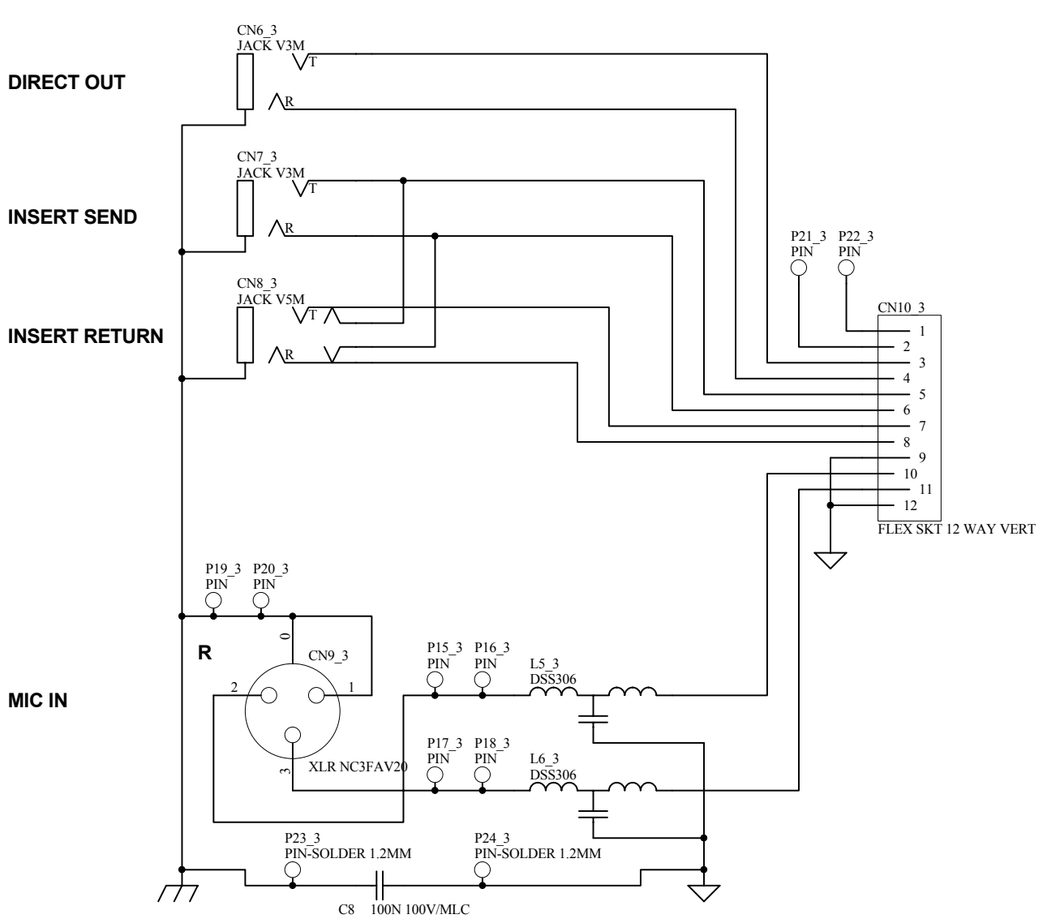
TITLE: ML5000 4SM CONN PCB
PAGE:

DRG No: C4845 ISSUE: 3 SHEET: 4 OF 5

MONO 3



MONO 4



D12

ALLEN&HEATH
Kernick Industrial Estate,
Penryn, Cornwall,
England. TR10 9LU
Tel: +44 (0)8707 556250
Fax: +44 (0)8707 556251

ISSUE	BY	DATE
2	AAT	18-04-02
3	AAT	02-05-02

FILE: C4845_3P5.Sch | PRINTED: 10:38:57 3-Dec-2002

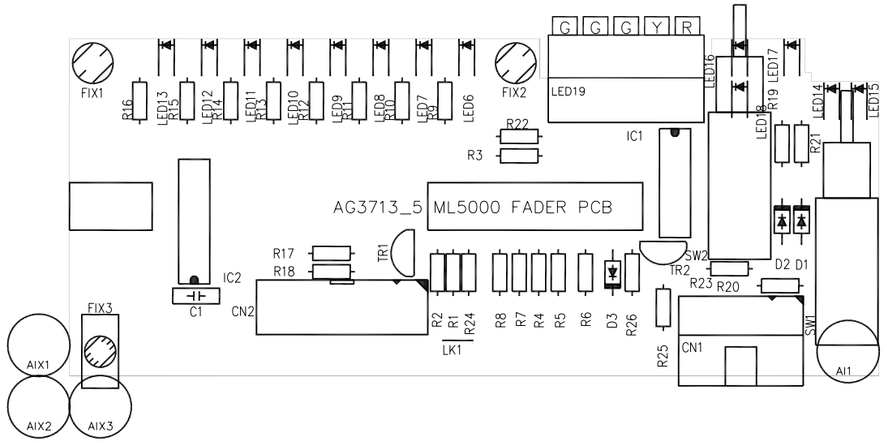
TITLE: ML5000 4SM CONN PCB
PAGE:

DRG No: C4845 ISSUE: 3 SHEET: 5 OF 5

AIX8

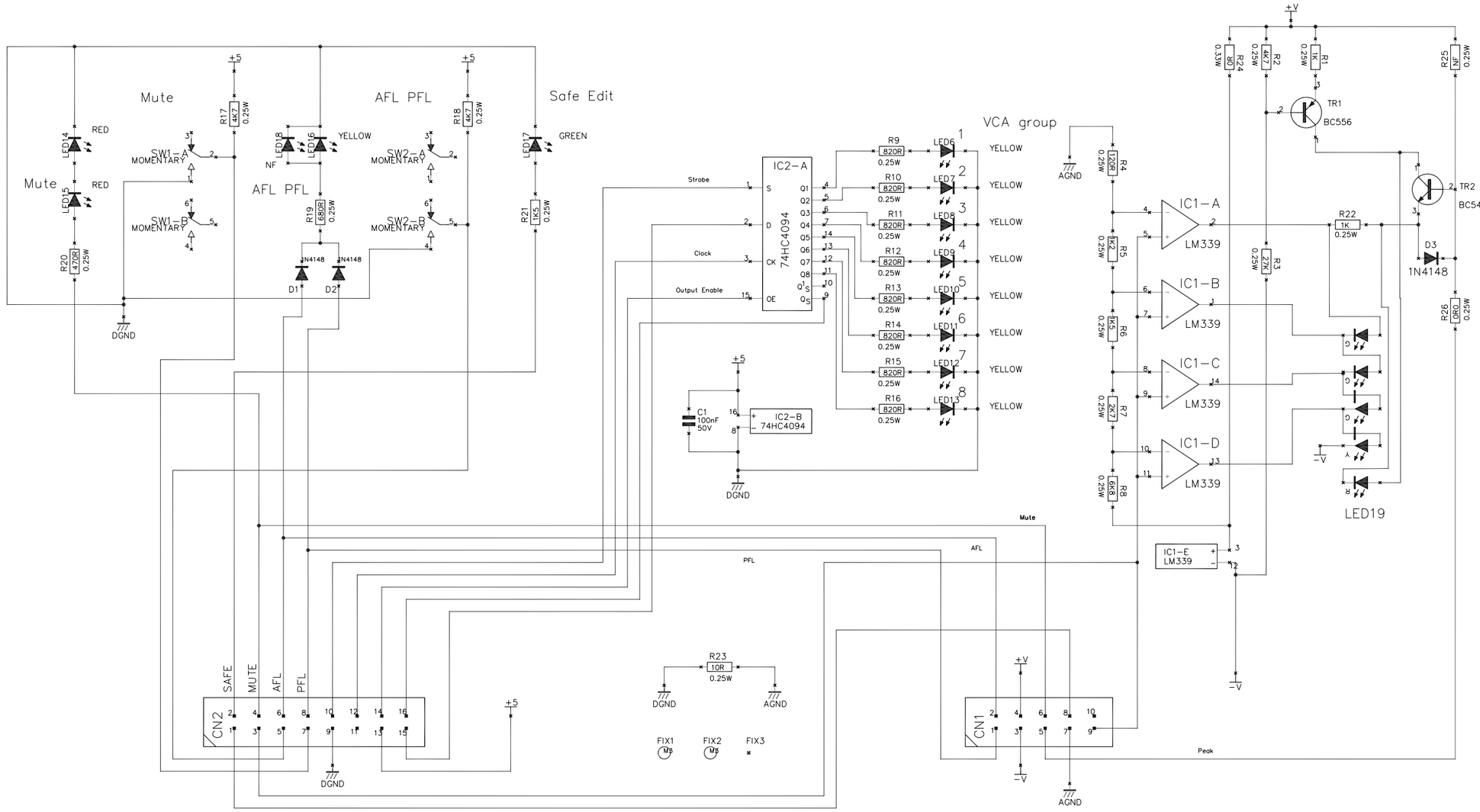
ALLEN &HEATH ML5000 FADER PCB AG3713_5

AIX7



AG3713 ISS 5 TOP SILK 11-11-00

D13



D14

ISS	REVISION	BY	DATE
A	ORIGIN	GMR	19/7/99
1	GROUND PLANE ADDED (DGND)TO PCB	AAT	02-12-99
2	TR1 LEDS MOVED, VALUES	AAT	29-02-00
3	SQUARE LED HOUSING	AAT	13-07-00
4	LED HOUSING POSITION CORRECTION	AAT	14-11-00
5	EARTHING CORRECTION	AAT	17-11-00

NOTES
1. RESISTORS MARKED * ARE 1%
   ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED
2. ELECTROLYTIC CAPACITORS ARE uF/VOLTS
3.

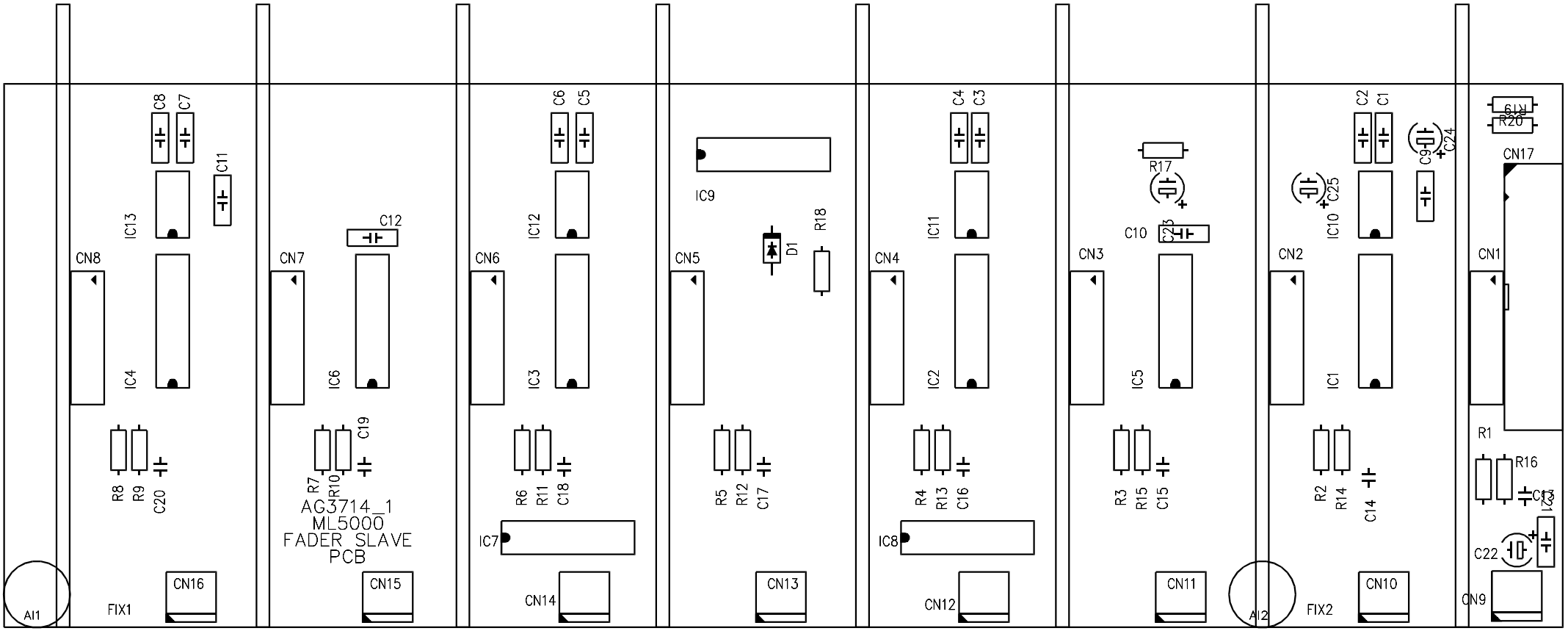
UNIT TITLE: ML5000

DRAWING TITLE: Mono input fader card

CIRCUIT DIAGRAM PCB AG3713

ALLEN & HEATH
PENRYN, CORNWALL
ENGLAND, TR10 9LU

DRAWING No 3713 SHT 1 OF 1 ISSUE 5 A1


AG3714_1
ML5000
FADER SLAVE
PCB
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
CN11
CN12
CN13
CN14
CN15
CN16
CN17
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC10
IC11
IC12
IC13
D1
FIX1
FIX2
AI1
AI2

D15

CN9 CN10 CN11 CN12 CN13 CN14 CN15 CN16

Fader 8 Fader 7 Fader 6 Fader 5 Fader 4 Fader 3 Fader 2 Fader 1

AGND C21 100nF 50V C22 47uF 25V

+5v adc

IC8-A IC4051B Fader voltage multiplexer

MF
VFBA0
VFBA1
VFBA2
MTREN_L
FADEN_L

IC7-A IC4051B Meter voltage multiplexer

SPISTB
SPICLK
SPIMOSIA
SPIOE

R1 1M5 0.25W R16 680K 0.25W C13 10nF 100V

IC1-A 74HC4094 LED Latch
IC2-A 74HC4094 LED Latch
IC3-A 74HC4094 LED Latch
IC4-A 74HC4094 LED Latch

R2 1M5 R14 680K C14 10nF 100V R15 680K R3 1M5

R4 1M5 R13 680K C16 100nF 100V R12 680K C17 100nF 100V R5 1M5

R6 1M5 R11 680K C18 100nF 100V R10 680K C19 100nF 100V R7 1M5

R8 1M5 R9 680K C20 10nF 100V

AGND

CN17 To CPU Board

FEMALE CN1 CN2 CN3 CN4 CN5 CN6 CN7 CN8

Chan 8 Chan 7 Chan 6 Chan 5 Chan 4 Chan 3 Chan 2 Chan 1

+V R19 10R 0.25W +5

SPIMOSIB
SPILD_L

R20 10R 0.25W

DGND AGND

SPIMISO

IC5-A 74HC165 Switch Latch
IC6-A 74HC165 Switch Latch

R18 10K 0.25W +5

IC10-A TL072 C1 100nF 50V Sample and hold
IC10-B TL072 C2 100nF 50V Sample and hold
IC11-A TL072 C3 100nF 50V Sample and hold
IC11-B TL072 C4 100nF 50V
IC12-A TL072 C5 100nF 50V Sample and hold
IC12-B TL072 C6 100nF 50V
IC13-A TL072 C7 100nF 50V Sample and hold
IC13-B TL072 C8 100nF 50V

IC9-A IC4051B VCA voltage demultiplexer

VCAWR_L
VCA

IC10-C TL072 C24 47uF 25V
IC11-C TL072 C11 100nF 50V
IC1-B 74HC4094 C12 100nF 50V
IC5-B 74HC165
IC2-B 74HC4094
R17 1K 0.25W
IC8-B IC4051B
IC7-B IC4051B
D1 1N4148
C23 47uF 25V
IC9-B IC4051B
IC3-B 74HC4094
IC12-C TL072 C25 47uF 25V
IC13-C TL072 C9 100nF 50V
IC6-B 74HC165
IC4-B 74HC4094 C10 100nF 50V

D16

ISS	REVISION	BY DATE
A	ORIGIN	GMR 28-07-99
1	Serial data flow changes GROUND PLANE ADDED	AAT 02-12-99
1.1	C1-8 Change to 100N MLC	AAT 25-07-00

NOTES
1. RESISTORS MARKED * ARE 1%
   ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED
2. ELECTROLYTIC CAPACITORS ARE uF/VOLTS
3.

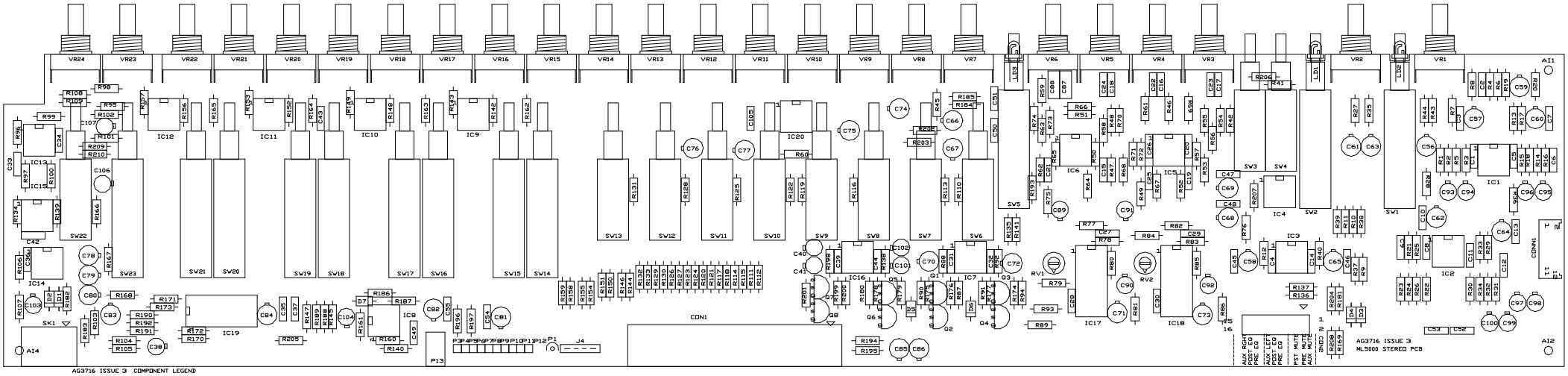
UNIT TITLE ML5000

DRAWING TITLE Channel Fader Slave Card

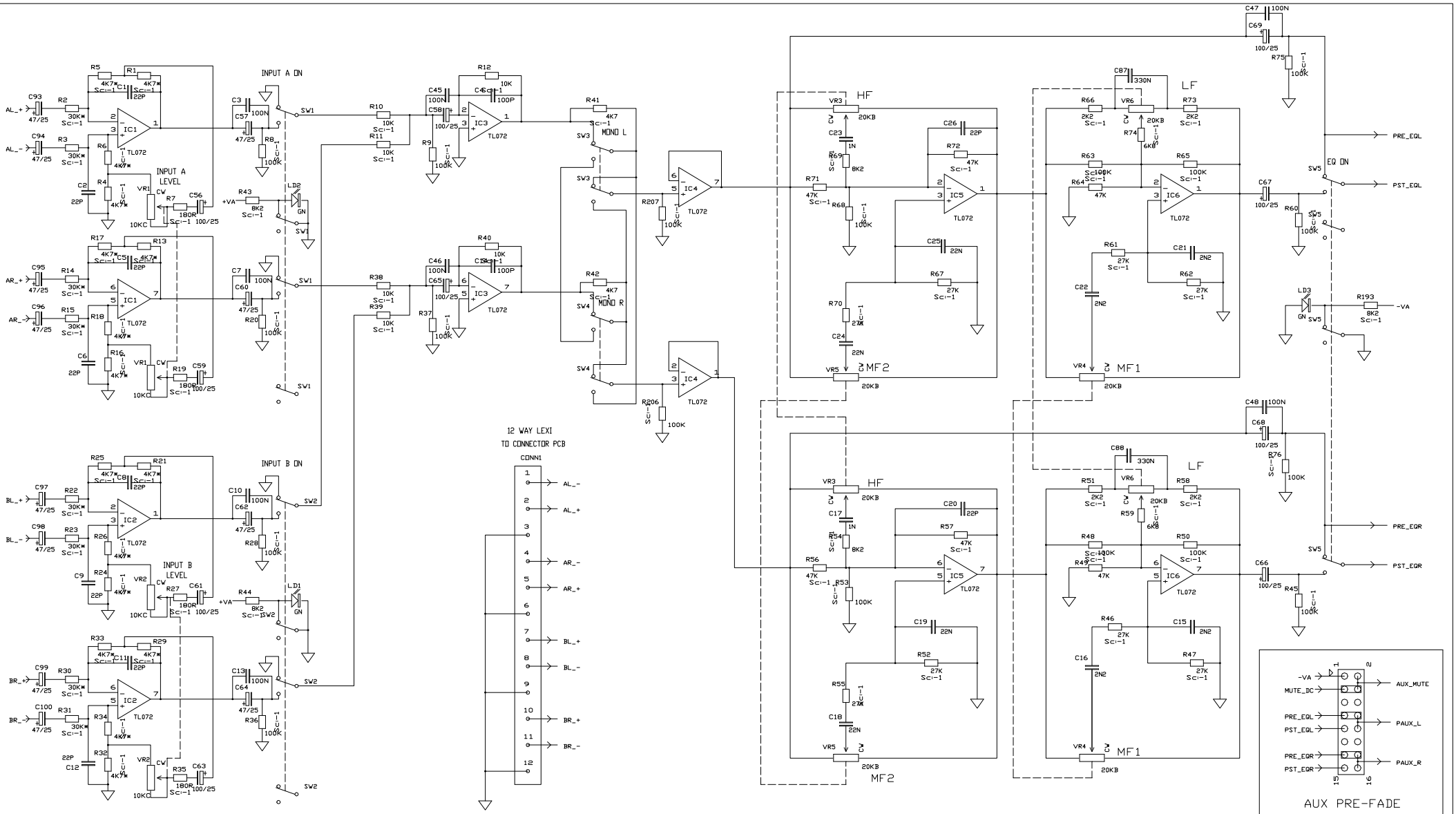
CIRCUIT DIAGRAM PCB AG3714

ALLEN & HEATH
PENRYN, CORNWALL
ENGLAND, TR10 9LU

DRAWING No C3714 SHT 1 OF 1 ISSUE 1.1 A1


AG3716 ISSUE 3 COMPONENT LEGEND
AG3716 ISSUE 3
ML5000 STEREO PCB

D17



ISS.	REVISION	BY	DATE
3	PFL UPDATE/DECOUPLING	RJ	23-5-00

NOTES

1. RESISTORS MARKED * ARE 1%
   ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE MARKED
2. ELECTROLYTIC CAPACITORS ARE ?F/VOLTS

UNIT TITLE: ML5000

DRAWING TITLE: STEREO PCB

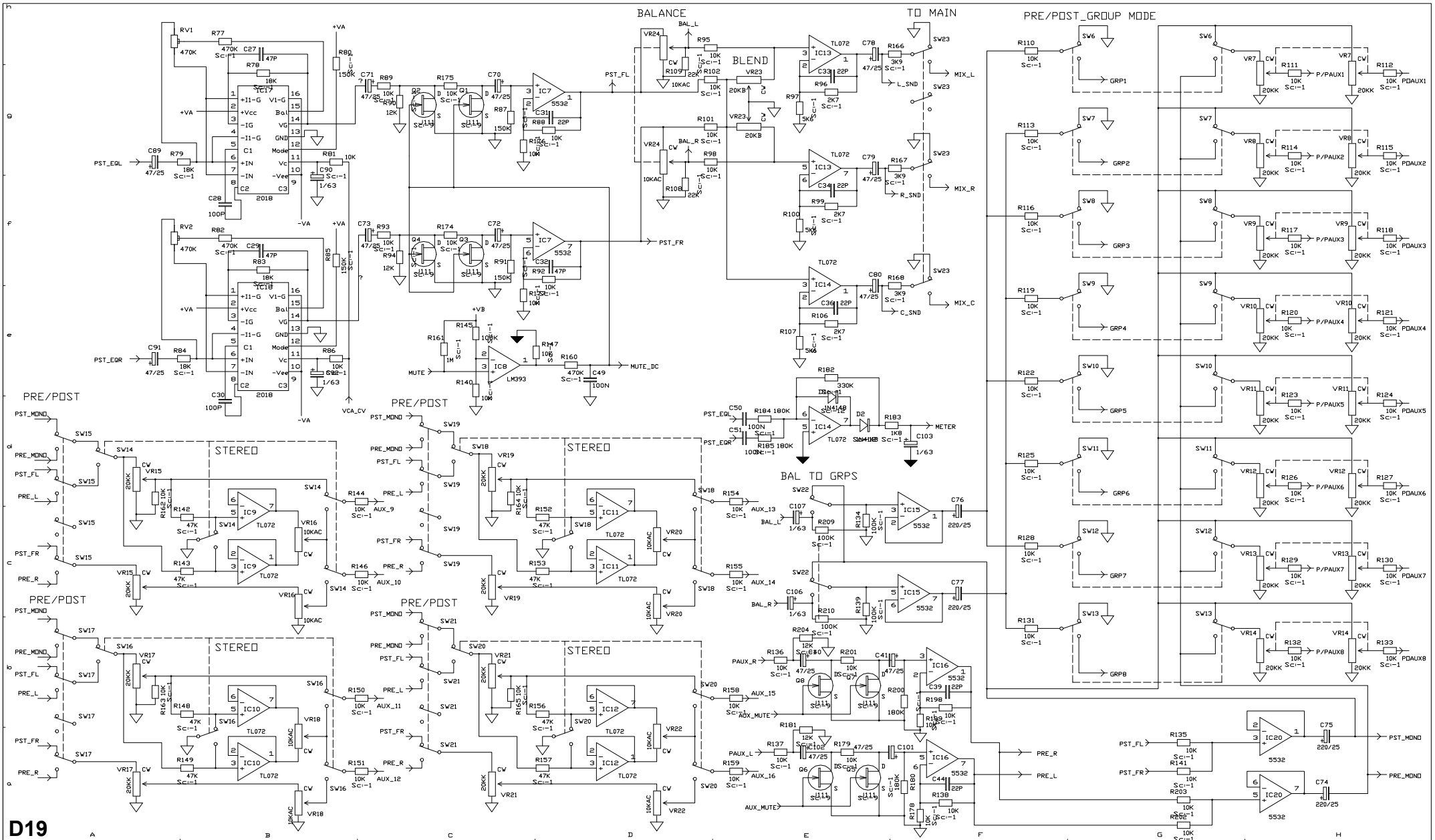
PCBAG3716

MANUFACTURED IN ENGLAND BY

ALLEN & HEATH

D18

DRAWING No. C3716 ISSUE 3 A2



ISS.	REVISION	BY	DATE
3	PFL UPDATE/DECOUPLING	RJ	23-5-00

NOTES

1. RESISTORS MARKED * ARE 1%
   ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE MARKED
2. ELECTROLYTIC CAPACITORS ARE ?F/VOLTS

UNIT TITLE: ML5000

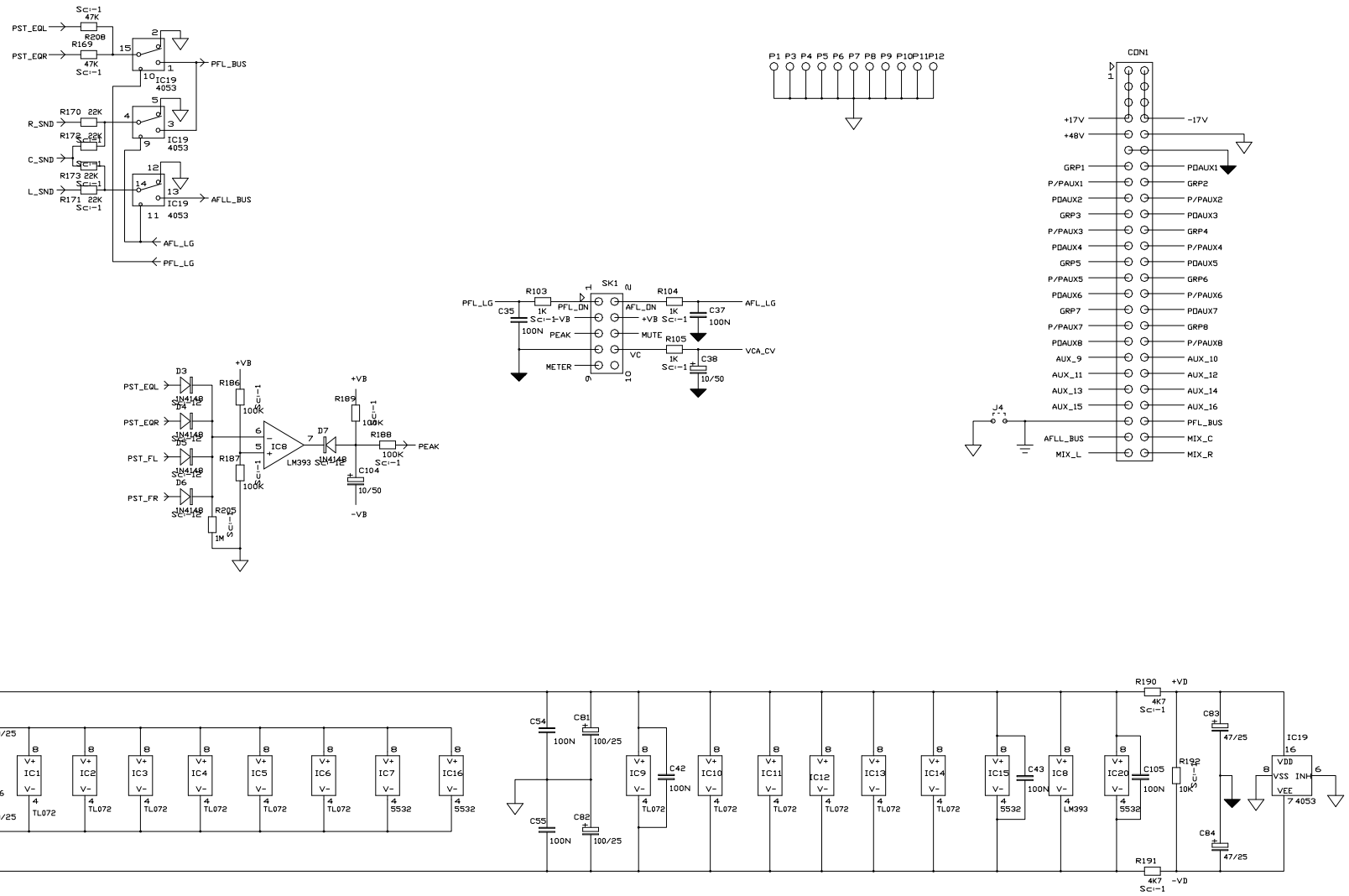
DRAWING TITLE: STEREO PCB

PCBAG3716

MANUFACTURED IN ENGLAND BY

ALLEN & HEATH

DRAWING No. C3716 ISSUE 3 A2



ISS.	REVISION	BY	DATE
3	PFL UPDATE/DECOUPLING	GRJ	23-5-00

NOTES

1. RESISTORS MARKED * ARE 1%
   ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE MARKED
2. ELECTROLYTIC CAPACITORS ARE ?F/VOLTS

UNIT TITLE: ML5000

DRAWING TITLE: STEREO PCB

PCBAG3716

MANUFACTURED IN ENGLAND BY

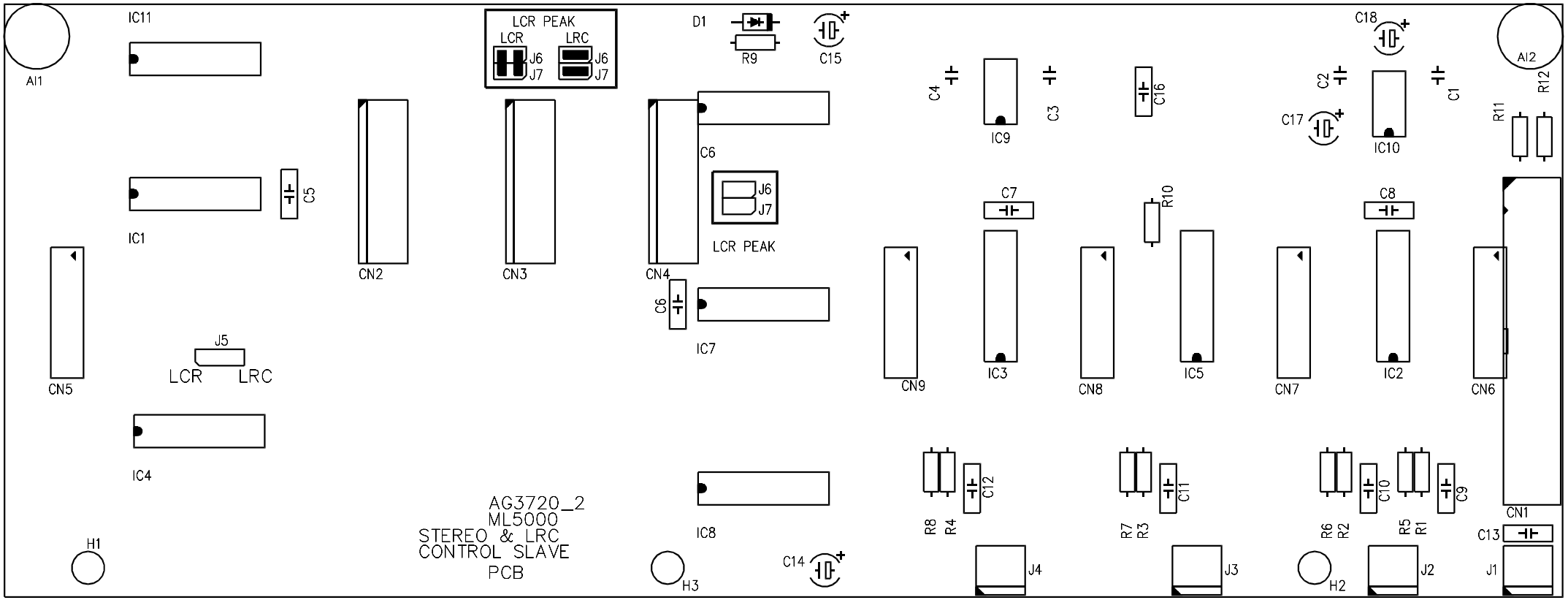
ALLEN & HEATH

D20

DRAWING No. C3716

ISSUE 3

A2


AI1
IC11
LCR PEAK
LCR
LRC
J6
J7
D1
R9
C15
C18
AI2
C4
C3
C16
C2
C1
C17
IC9
IC10
R11
R12
IC1
C5
CN2
CN3
C6
J6
J7
LCR PEAK
CN4
C7
C8
R10
C6
IC7
CN5
J5
LCR
LRC
CN9
IC3
CN8
IC5
CN7
IC2
CN6
CN1
IC4
AG3720_2
ML5000
STEREO & LRC
CONTROL SLAVE
PCB
IC8
R8
R4
C12
R7
R3
C11
R6
R2
C10
R5
R1
C9
C13
H1
H3
C14
J4
J3
H2
J2
J1

D21

Fader st4
Fader st3
Fader st2
Fader st1
Fader multiplexer
IC4051B
Meter multiplexer
NF
CN1
To CPU pcb
PEAK
LEFTPK
RIGHTPK
CENTREPK
LRC
LCR
Control pad
FEMALE
LED Latch
74HC4094
L
R(C)
C(R)
74HC165
Switch Latch
Sample and Hold
TL072
VCA de-multiplexer
AGND
DGND
+5
+V
-V

D22

ISS	REVISION	BY	DATE
A	ORIGIN	GMR	11/8/99
B	Various logic changes	GMR	18/10/99
1	GROUND PLANE ADDED TO PCB MOUNTS	AAT	02-12-99
2	GROUND PLANE ADDED TO PCB MOUNTS	AAT	22-02-00

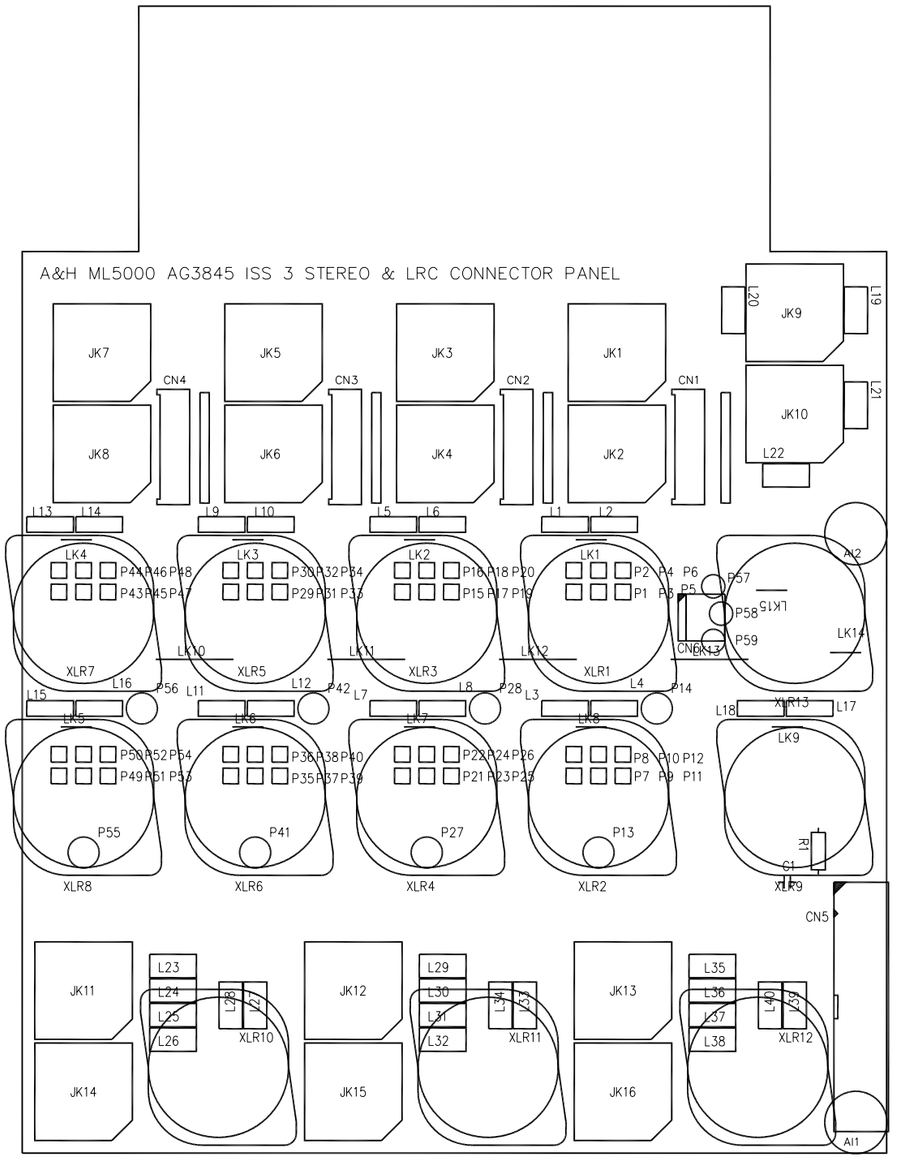
NOTES
1. RESISTORS MARKED * ARE 1%
   ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED
2. ELECTROLYTIC CAPACITORS ARE uF/VOLTS
3.

UNIT TITLE: ML5000

DRAWING TITLE: Stereo LRC and Control Slave CIRCUIT DIAGRAM PCB AG 3720

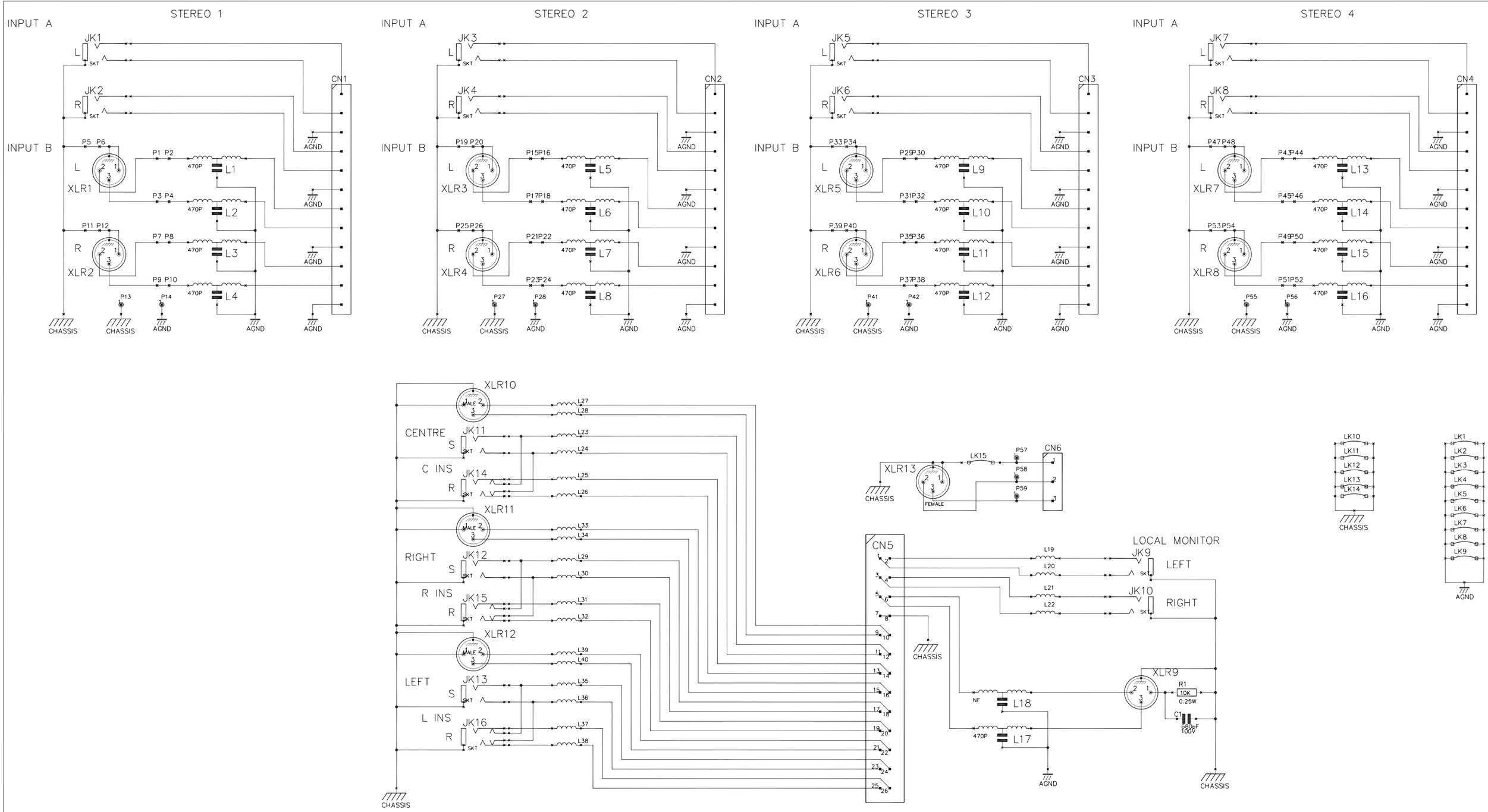
ALLEN & HEATH
PENRYN, CORNWALL
ENGLAND, TR10 9LU

DRAWING No 3720 SHT 1 OF 1 ISSUE 2 A1



AG3845 ISS 3 TOP SILK AAT 23-03-00

D23



D24

ISS	REVISION	BY DATE
A	ORIGIN	AAT 27-08-99
2	PRODUCTION	AAT 23-03-00
3	GROUND PLANE CLEARANCE	AAT 10-09-01

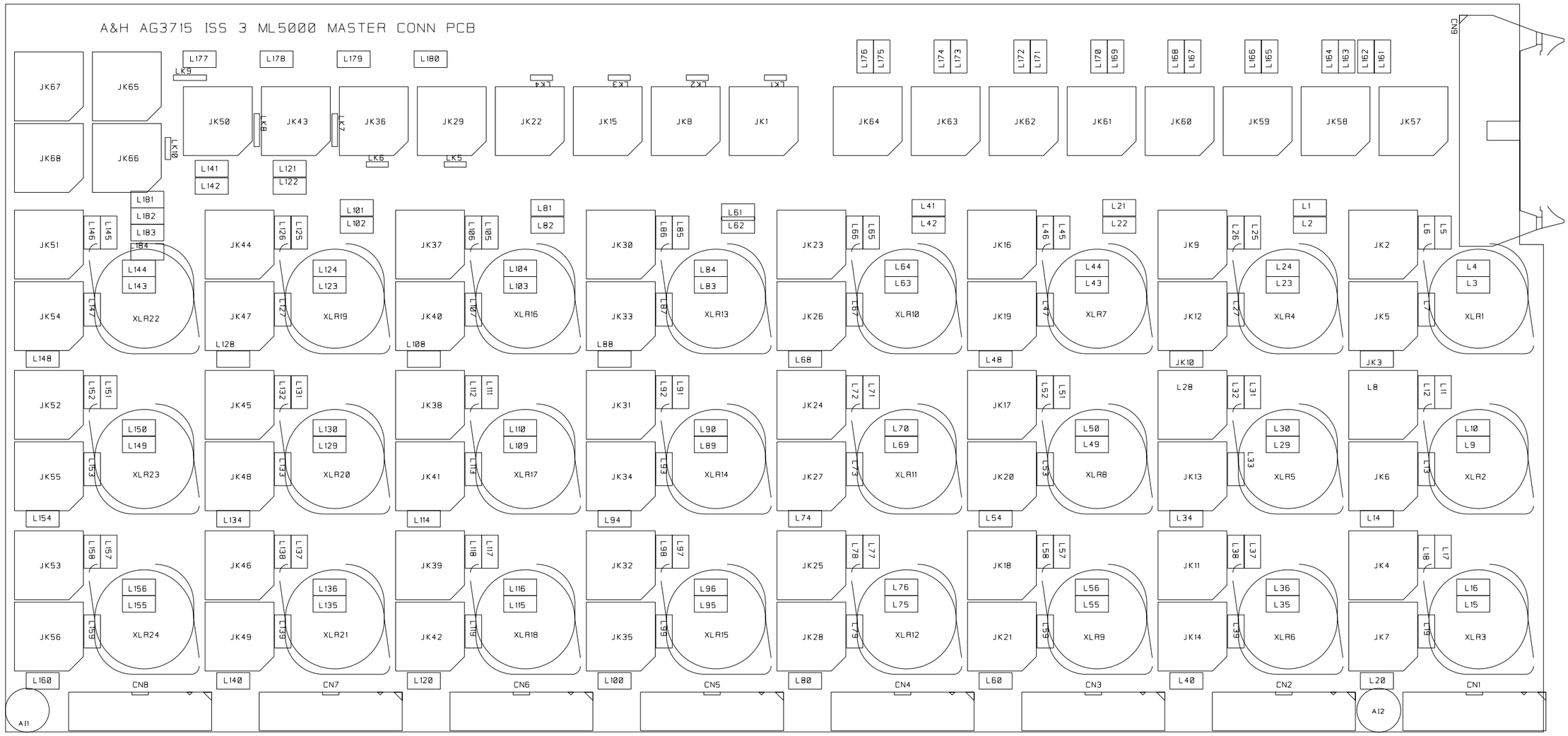
NOTES
1. RESISTORS MARKED * ARE 1%
   ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED
2. ELECTROLYTIC CAPACITORS ARE uF/VOLTS
3.

UNIT TITLE: ML5000

DRAWING TITLE: CIRCUIT DIAGRAM
STEREO LRC CONN
PCB AG 3845

ALLEN & HEATH
PENRYN, CORNWALL
ENGLAND, TR10 9LU

DRAWING No C C3845 SHT 1 OF 1 ISSUE 3 A1


A&H AG3715 ISS 3 ML5000 MASTER CONN PCB
CN9
JK67
JK65
JK68
JK66
JK50
JK43
JK36
JK29
JK22
JK15
JK8
JK1
JK64
JK63
JK62
JK61
JK60
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JK58
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JK18
JK21
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JK12
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JK14
JK2
JK5
L8
JK6
JK4
JK7
XLR22
XLR19
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XLR4
XLR1
XLR23
XLR20
XLR17
XLR14
XLR11
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XLR15
XLR12
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CN5
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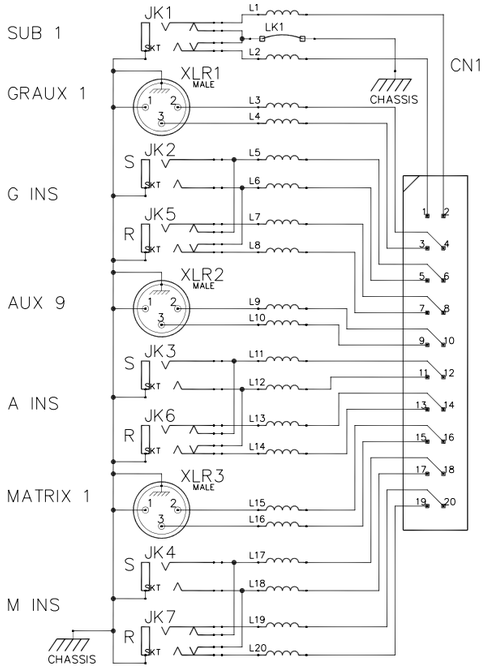
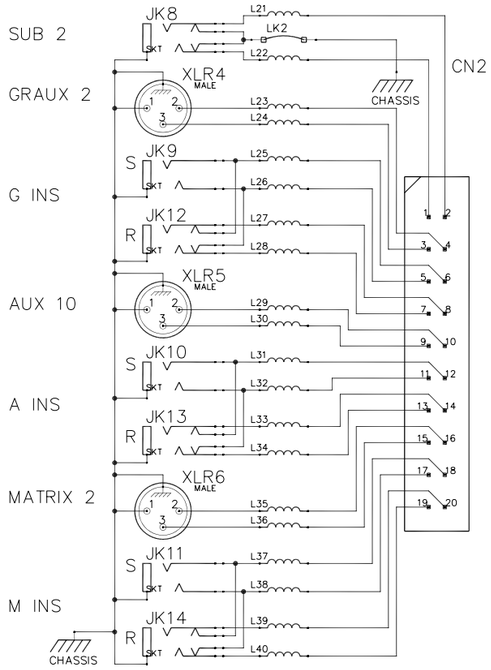
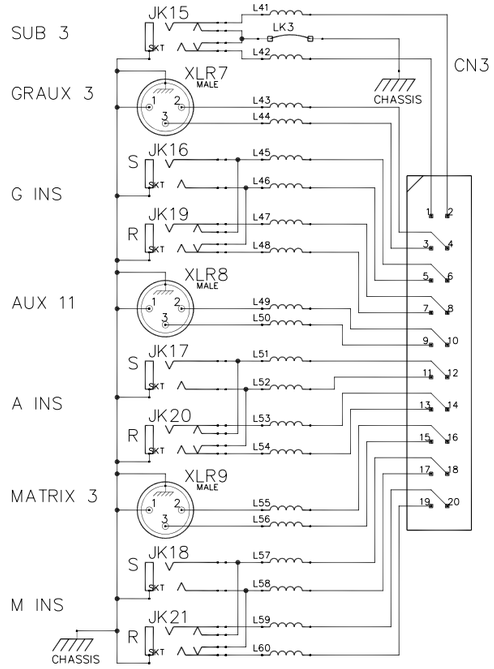
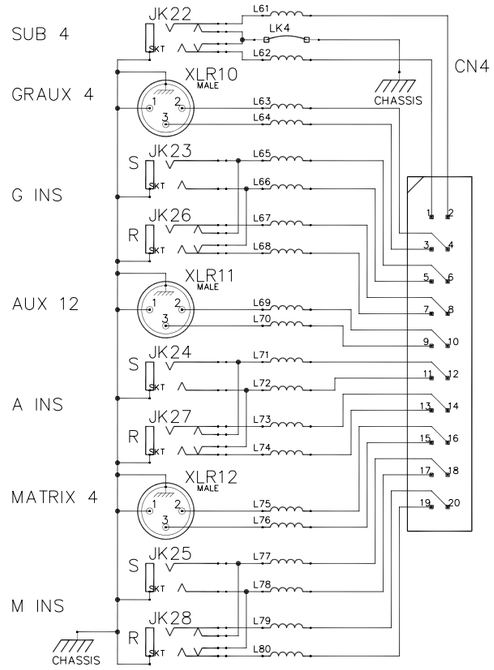
CN2
CN1
A11
A12

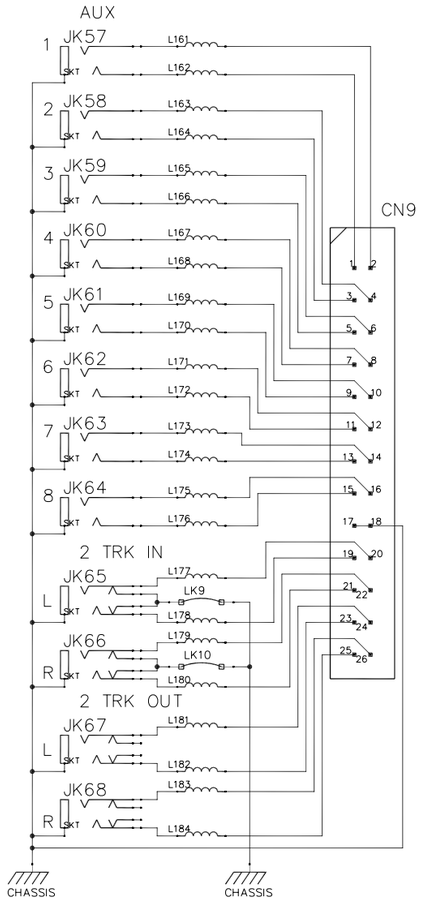
D25

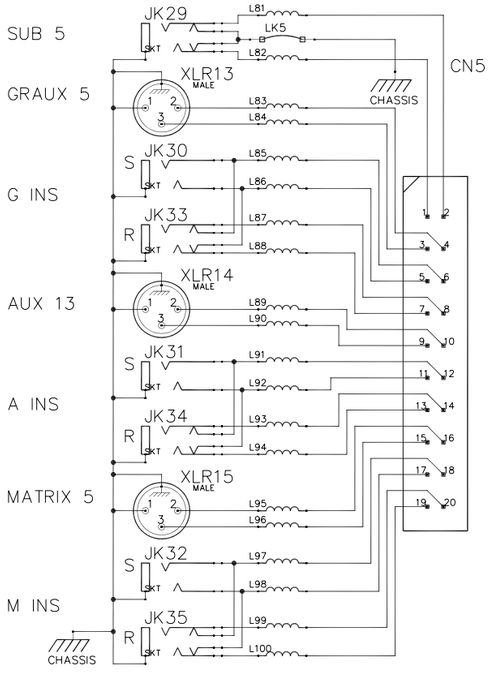


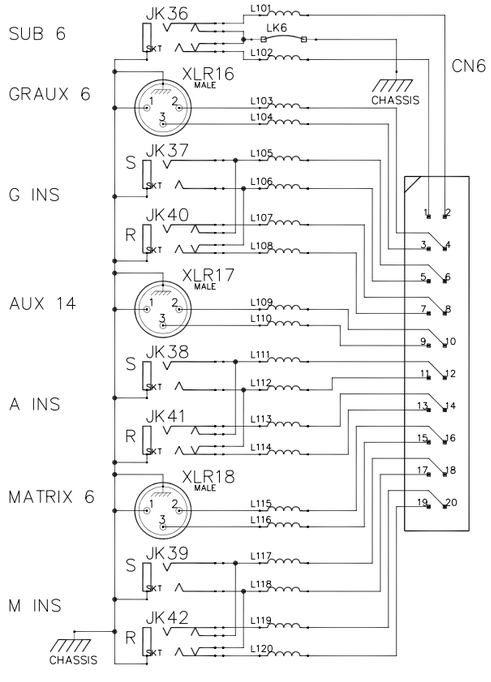


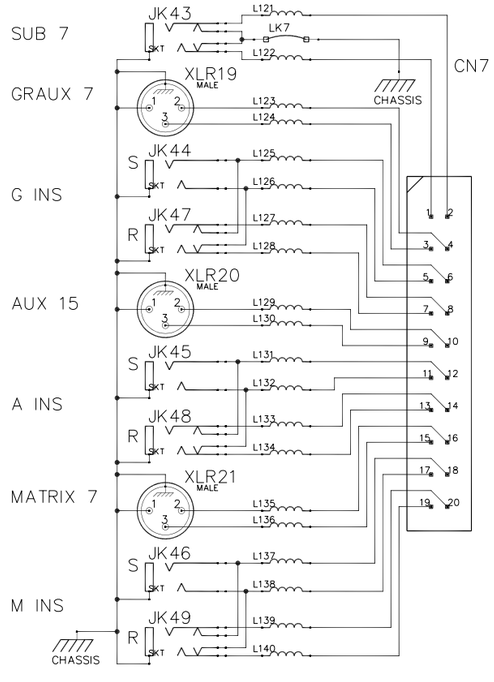


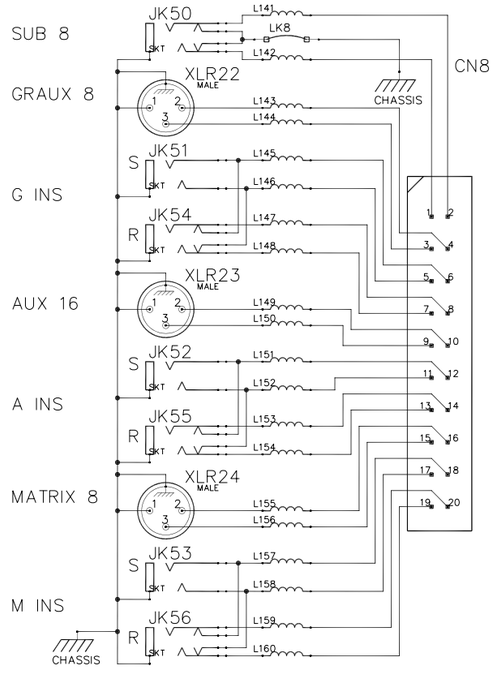












D26

ISS	REVISION	BY DATE
A	ORIGIN	AAT 27-07-99
1	CN9 MV. CHG TO RA.GND ON XLR	AAT 13-12-99
2	SUBS AND 2 TRK NORMALISED	AAT 05-06-00
3	GROUND PLANE CLEARANCE	AAT 10-09-01

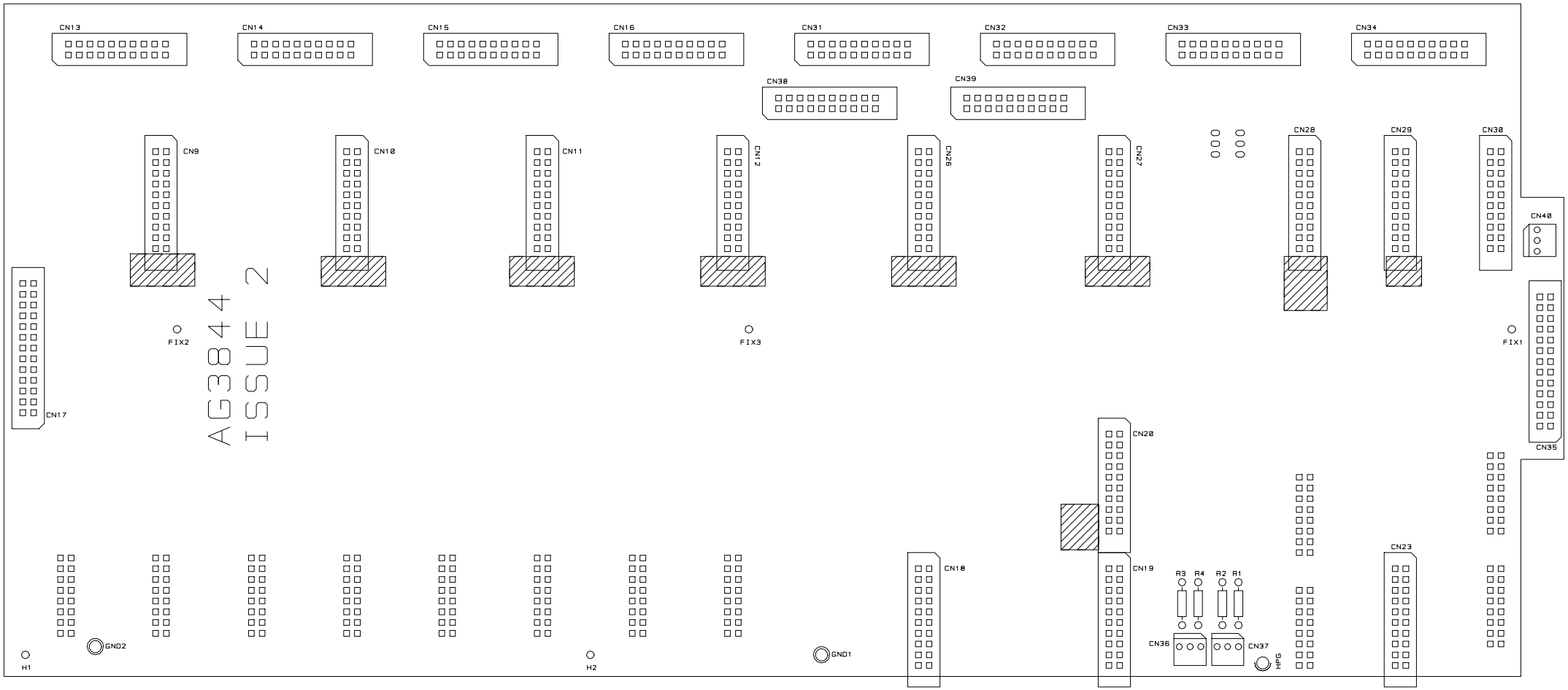
NOTES
1. RESISTORS MARKED * ARE 1%
   ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED
2. ELECTROLYTIC CAPACITORS ARE uF/VOLTS
3.

UNIT TITLE: ML5000

DRAWING TITLE: MASTER CONNECTOR PCB
CIRCUIT DIAGRAM PCB AG 3715

ALLEN & HEATH
PENRYN, CORNWALL
ENGLAND, TR10 9LU

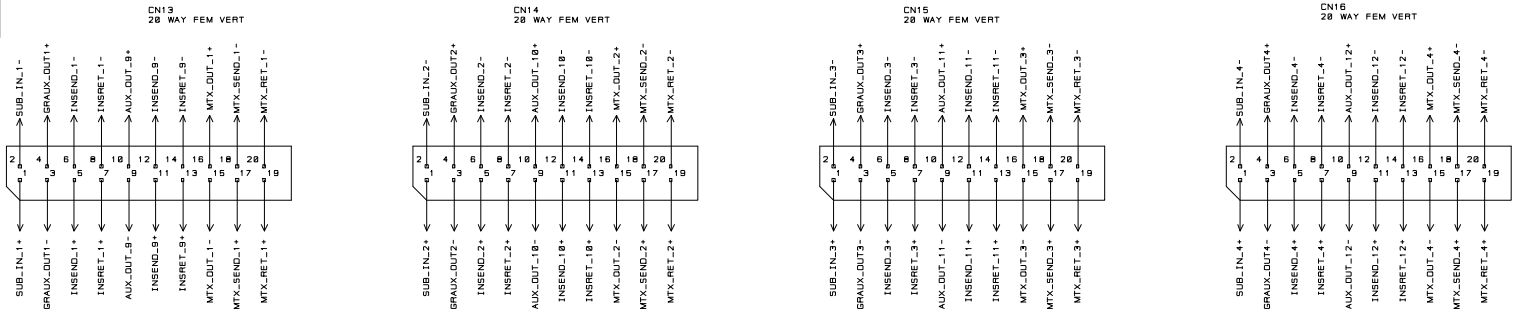
DRAWING No C3715 SHT 1 OF 1 ISSUE 3 A1


CN13
CN14
CN15
CN16
CN31
CN32
CN33
CN34
CN38
CN39
CN9
CN10
CN11
CN12
CN26
CN27
CN28
CN29
CN30
CN40
CN17
FIX2
FIX3
FIX1
AG3844
ISSUE 2
CN35
CN20
CN18
CN19
CN23
R3
R4
R2
R1
CN36
CN37
HPG
GND2
GND1
H1
H2

D27

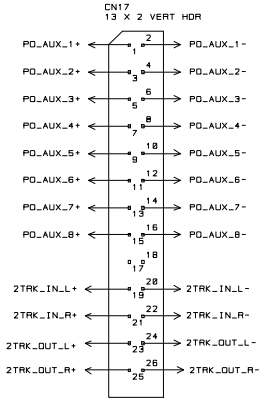
DRG NO.	3844

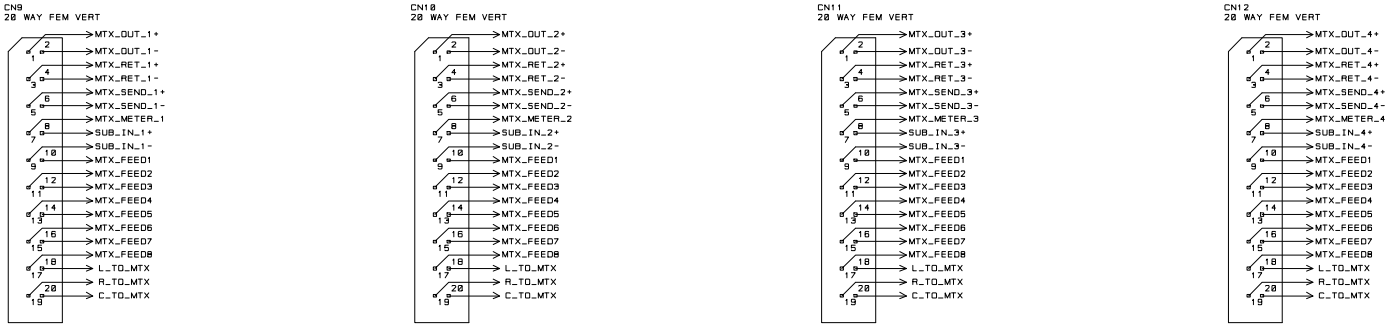
INITIAL	ISSUE	DATE
MG	2	8-5-00



CONNECTIONS TO REAR CONNECTOR BOARD

TO REAR CONNECTOR PCB





GROUP/AUX 1

GROUP/AUX 2

GROUP/AUX 3

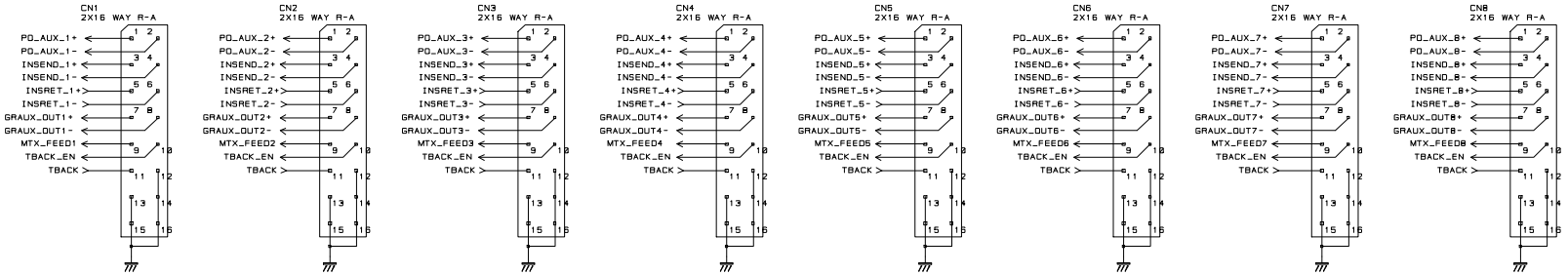
GROUP/AUX 4

GROUP/AUX 5

GROUP/AUX 6

GROUP/AUX 7

GROUP/AUX 8



D28

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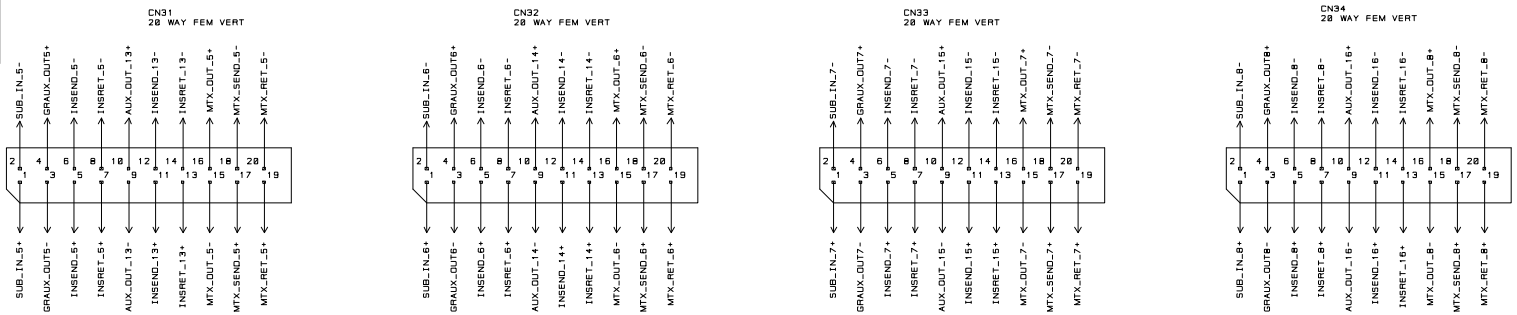
FAX: 01326 377097

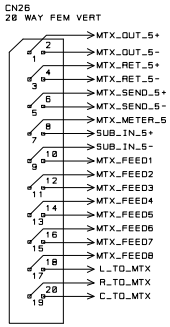
TITLE ML5000
BACKPLANE
SIGNAL DIST PCB

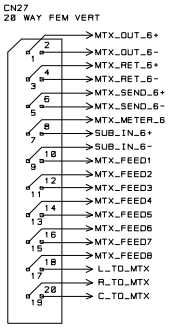
DRG NO. 3844

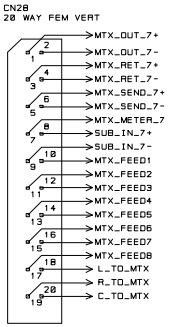
SHT. 1 OF 2

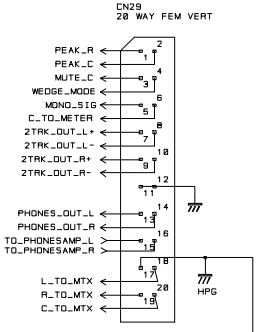
DRG NO.	INITIAL	ISSUE	DATE
3844	MG	2	8-5-00

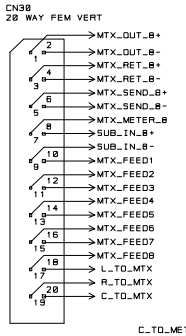


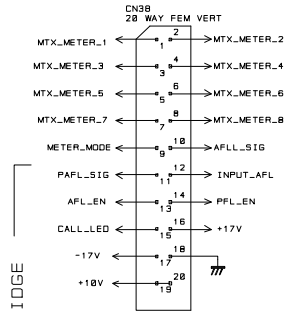


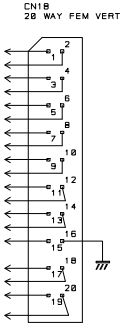


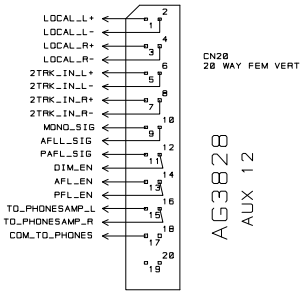


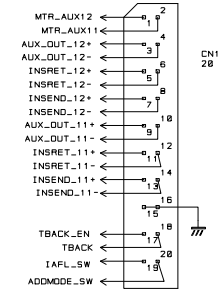


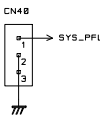


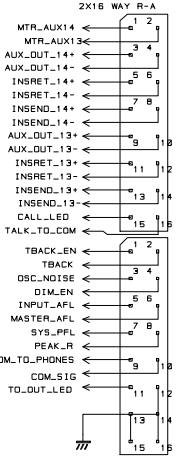


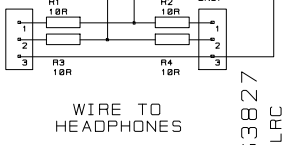


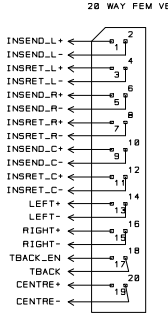


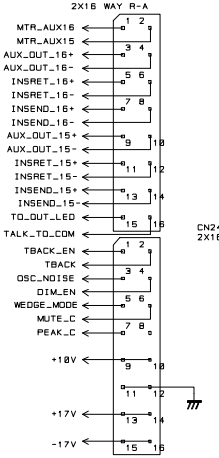


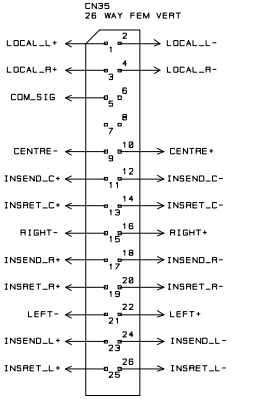












AG3826 AUX 10

AG3828 AUX 12

AG3829 AUX 14

AG3827 LRC

AG3830 AUX 16

D29

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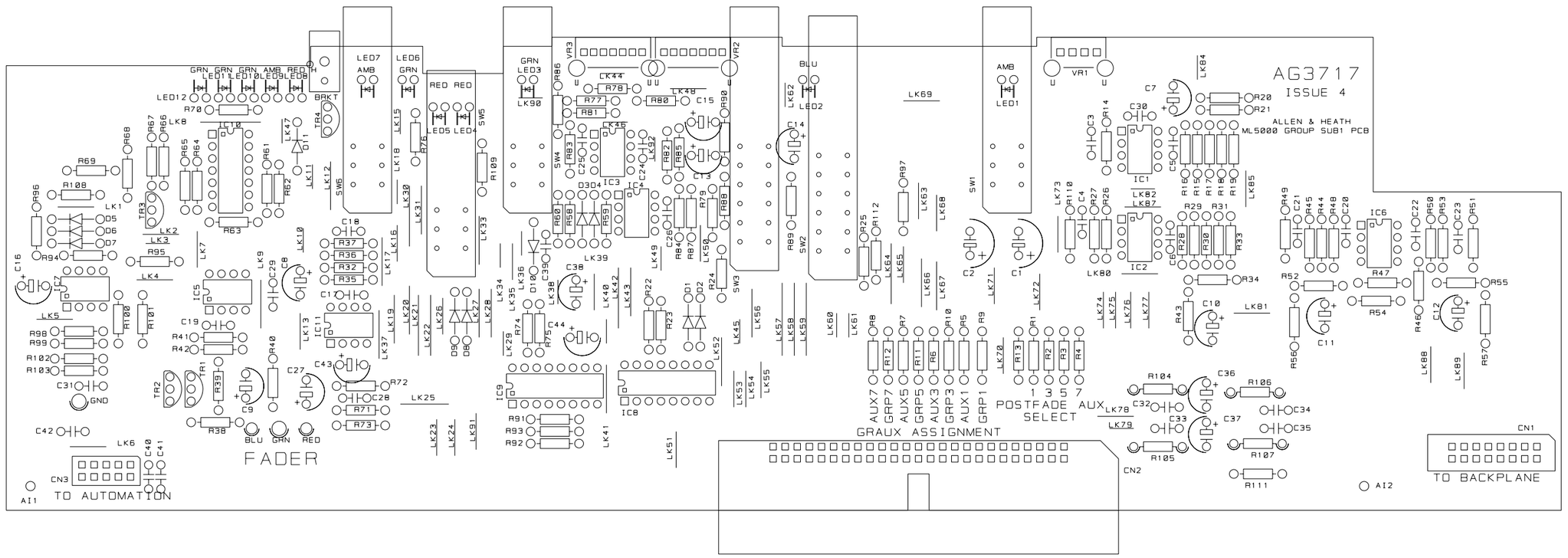
FAX: 01326 377097

TITLE
ML5000
BACKPLANE
SIGNAL DIST PCB

DRG NO. 3844

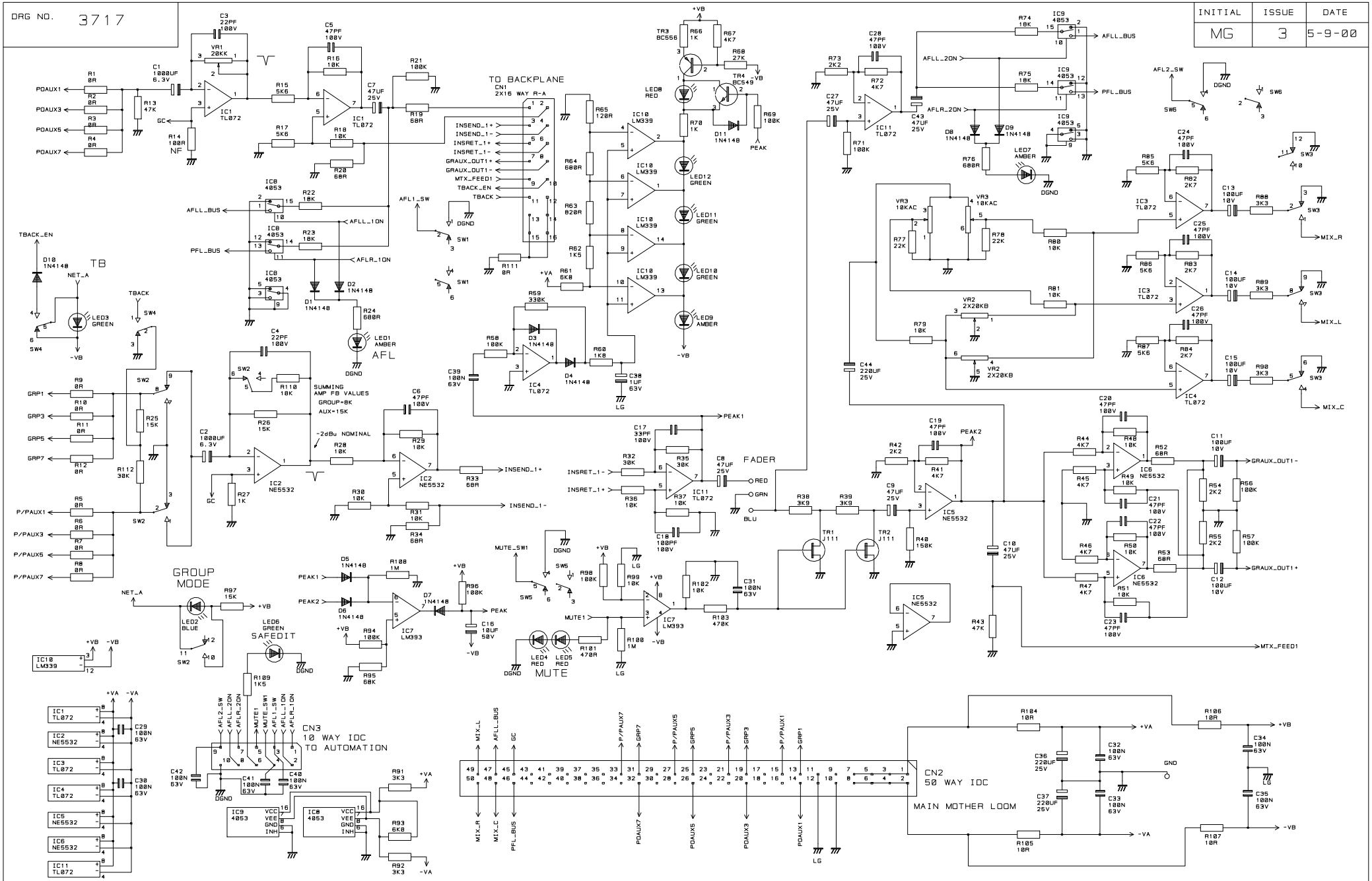
SHT. 2 OF 2


AG3717
ISSUE 4
ALLEN & HEATH
ML5000 GROUP SUB1 PCB
FADER
TO AUTOMATION
TO BACKPLANE
GRAUX ASSIGNMENT
POSTFADE AUX
SELECT
AUX7
GRP7
AUX5
GRP5
AUX3
GRP3
AUX1
GRP1
1 3 5 7
GRN GRN GRN AMB RED
LED11 LED10 LED9 LED8
LED12
LED7
LED6
AMB
GRN
RED RED
LED5 LED4
GRN
LED3
BLU
LED2
AMB
LED1
BRK
BLU GRN RED
GND
CN1
CN2
CN3
AI1
AI2

D30

DRG NO.	3717

INITIAL	ISSUE	DATE
MG	3	5-9-00



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NOTES

VR1 20KK VR2 2X20KB VR3 10KAC

DRN.	MG

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CORNWALL
TR10 9LU
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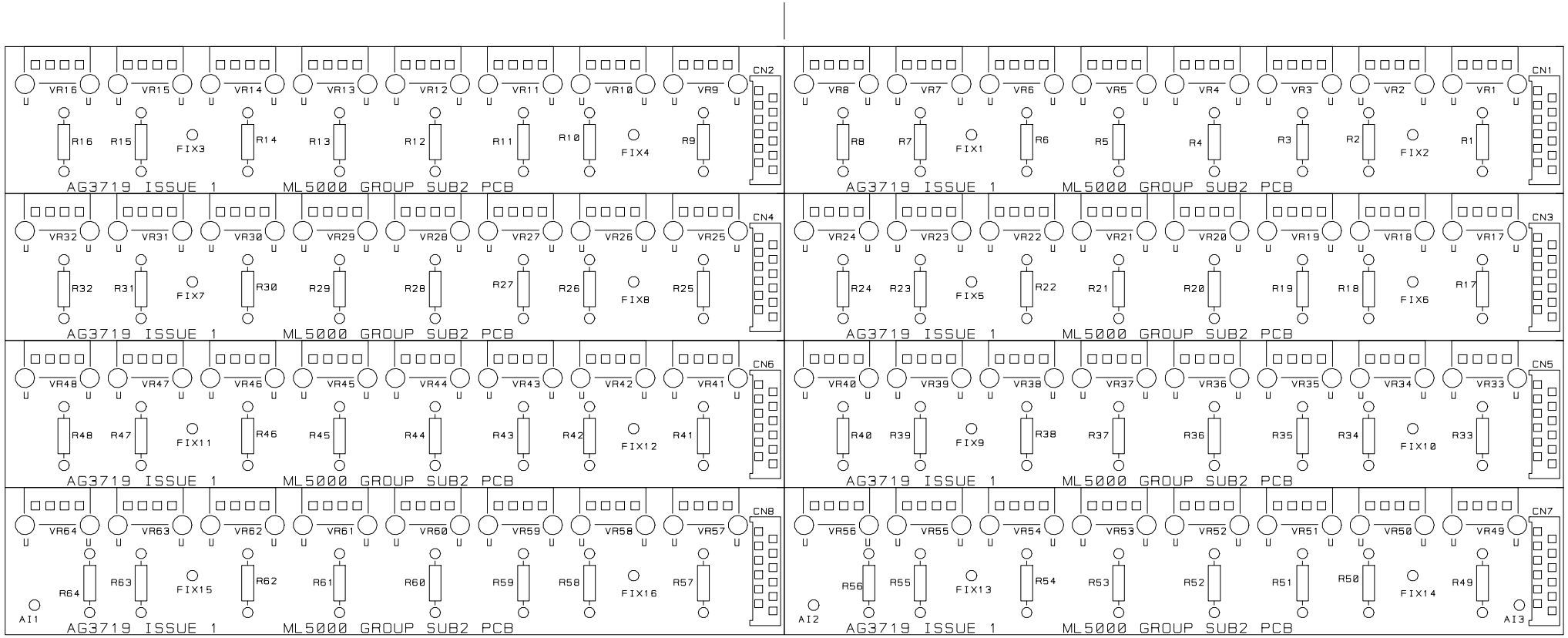
TITLE
ML5000
GROUP SUB1

DRG NO.
3717

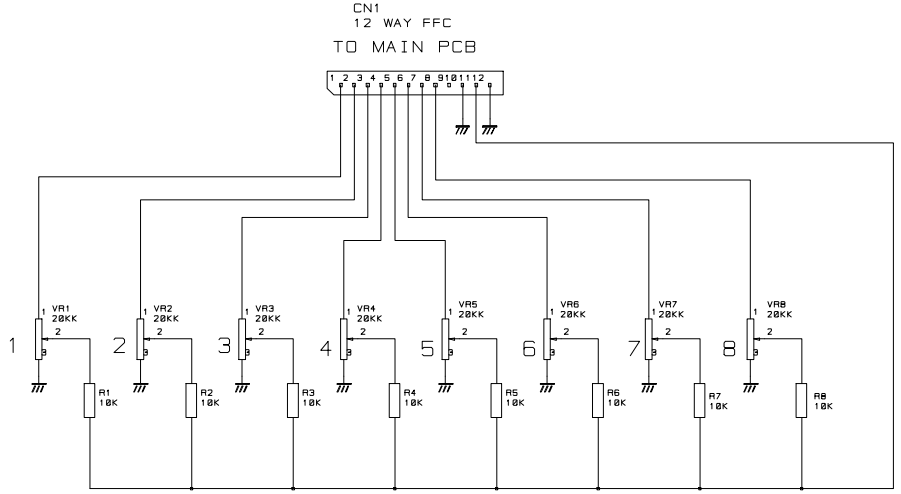
SHT. 1 OF 1

D31


VR16 VR15 VR14 VR13 VR12 VR11 VR10 VR9
R16 R15 FIX3 R14 R13 R12 R11 R10 FIX4 R9
CN2
AG3719 ISSUE 1 ML5000 GROUP SUB2 PCB
VR8 VR7 VR6 VR5 VR4 VR3 VR2 VR1
R8 R7 FIX1 R6 R5 R4 R3 R2 FIX2 R1
CN1
AG3719 ISSUE 1 ML5000 GROUP SUB2 PCB
VR32 VR31 VR30 VR29 VR28 VR27 VR26 VR25
R32 R31 FIX7 R30 R29 R28 R27 R26 FIX8 R25
CN4
AG3719 ISSUE 1 ML5000 GROUP SUB2 PCB
VR24 VR23 VR22 VR21 VR20 VR19 VR18 VR17
R24 R23 FIX5 R22 R21 R20 R19 R18 FIX6 R17
CN3
AG3719 ISSUE 1 ML5000 GROUP SUB2 PCB
VR48 VR47 VR46 VR45 VR44 VR43 VR42 VR41
R48 R47 FIX11 R46 R45 R44 R43 R42 FIX12 R41
CN6
AG3719 ISSUE 1 ML5000 GROUP SUB2 PCB
VR40 VR39 VR38 VR37 VR36 VR35 VR34 VR33
R40 R39 FIX9 R38 R37 R36 R35 R34 FIX10 R33
CN5
AG3719 ISSUE 1 ML5000 GROUP SUB2 PCB
VR64 VR63 VR62 VR61 VR60 VR59 VR58 VR57
R64 R63 FIX15 R62 R61 R60 R59 R58 FIX16 R57
CN8
AI1
AG3719 ISSUE 1 ML5000 GROUP SUB2 PCB
VR56 VR55 VR54 VR53 VR52 VR51 VR50 VR49
R56 R55 FIX13 R54 R53 R52 R51 R50 FIX14 R49
CN7
AI2
AI3
AG3719 ISSUE 1 ML5000 GROUP SUB2 PCB

DRG NO.	3719

INITIAL	ISSUE	DATE
MG	1	20-3-00



THIS CIRCUIT IS REPEATED ANOTHER 7 TIMES
PER 8 WAY PANEL

D33□

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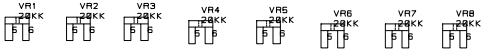

DRN. MG

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CORNWALL
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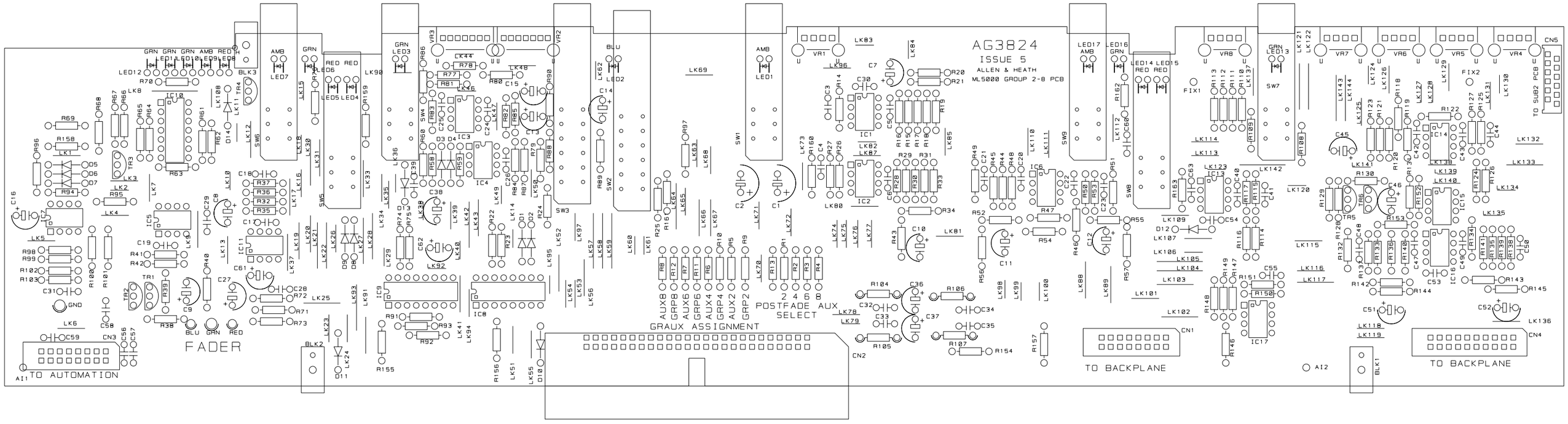
TITLE
ML5000
GROUP SUB2

DRG NO.
3719

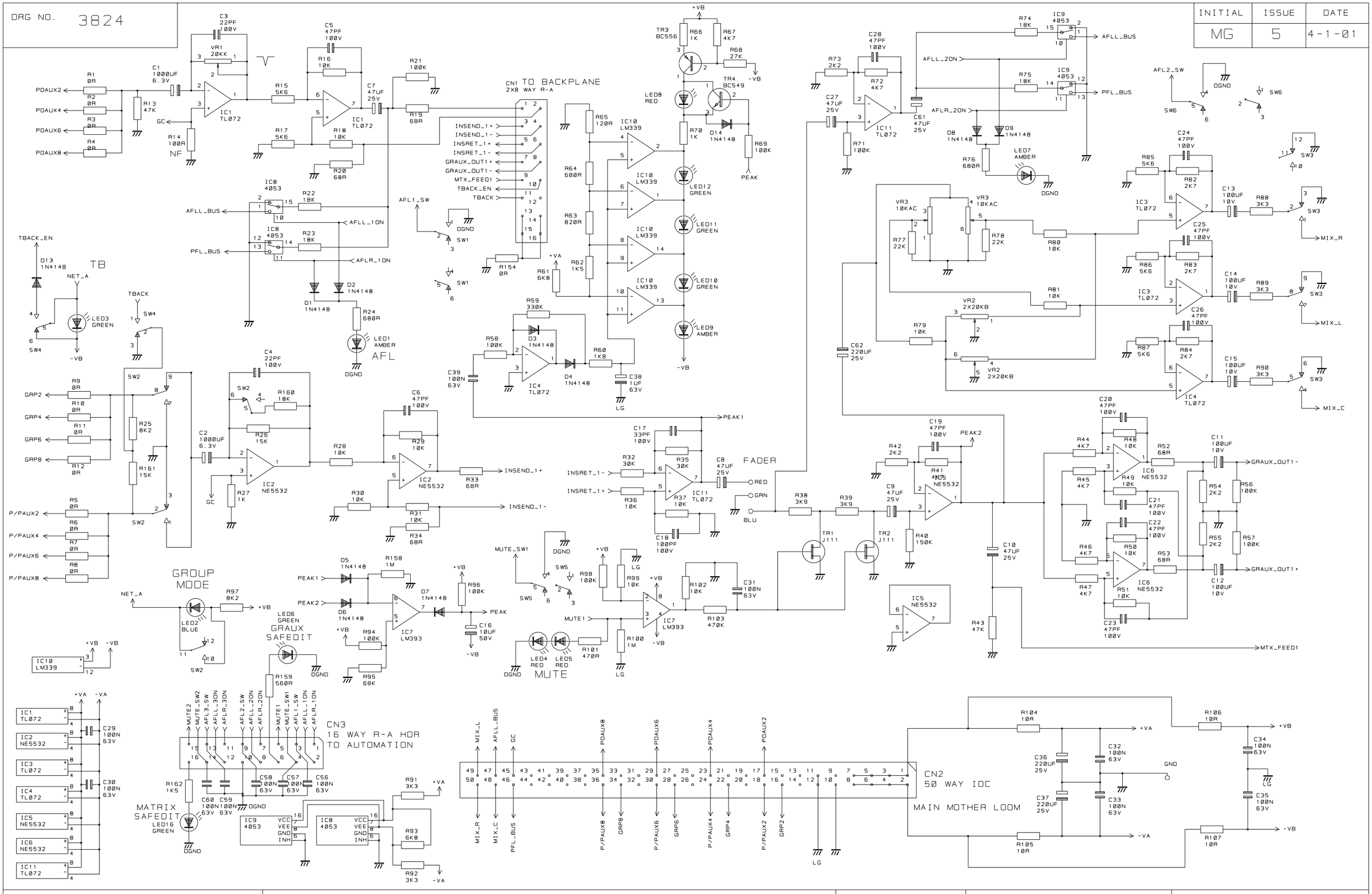
SHT. 1 OF 1


AG3824
ISSUE 5
ALLEN & HEATH
ML5000 GROUP 2-8 PCB
FADER
TO AUTOMATION
TO BACKPLANE
TO BACKPLANE
TO SUB2 PCB
GRAUX ASSIGNMENT
POSTFADE AUX SELECT
2 4 6 8
AUX8 GRP8 AUX6 GRP6 AUX4 GRP4 AUX2 GRP2
GRN GRN GRN AMB RED
LED12 LED11 LED10 LED9 LED8
AMB LED7
GRN LED6
RED RED LED5 LED4
GRN LED3
BLU LED2
AMB LED1
LED17 AMB
LED16 GRN
LED14 LED15 RED RED
GRN LED13
BLK3
BLK2
BLK1
CN1
CN2
CN3
CN4
CN5
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
VR1
VR2
VR3
VR4
VR5
VR6
VR7
VR8
FIX1
FIX2
TR1
TR2
TR3
TR4
TR5
TR6
IC1
IC2
IC3
IC4
IC5
IC6
IC8
IC9
IC10
IC11
IC13
IC14
IC15
IC16
IC17
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D14
GND
BLU GRN RED
AI1
AI2

D34

DRG NO.	3824

INITIAL	ISSUE	DATE
MG	5	4-1-01



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D35

NOTES

VR1 20KK
VR2 2X20KB
VR3 10KAC

DRN. MG

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CORNWALL
TR10 9LU
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FAX: 01326 377097

TITLE
ML5000
GROUP 2 TO 8

DRG NO. 3824

SHT. 1 OF 2

DRG NO.	3824

INITIAL	ISSUE	DATE
MG	5	4-1-01

TBACK_EN
+VB
R108 15K
D12 1N4148
LED13 GREEN
SW7
-VB
TBACK
SW7

TB
TO MATRIX

C40 33PF 100V
R116 30K
R117 15K
SUB_IN-
SUB_IN+
R114 10K
IC13 NE5532
R115 4K7
C41 100PF 100V

CN4
20 WAY R-A HDR
MTX_OUT+
MTX_OUT-
MTX_RET+
MTX_RET-
MTX_SEND+
MTX_SEND-
MTX_METER
SUB_IN+
SUB_IN-
L_TO_MTX
R_TO_MTX
C_TO_MTX

CN5
12 WAY FFC CON

L_TO_MTX
R_TO_MTX
C_TO_MTX
VR4 20KK
VR5 20KK
VR6 20KK
VR7 20KK
R110 10K
R111 10K
R112 10K
R113 10K
R109 39K
C63 33PF 100V
R163 18K
IC13 NE5532
R118 4K7
C42 33PF 100V
R119 10K
R122 68R
IC14 TL072
MTX_SEND+
R120 4K7
R121 10K
MTX_SEND-
R123 68R

R155 9K1
IC9 4053
AFLL_BUS
AFLL_3ON
R156 9K1
IC8 4053
PFL_BUS
AFLR_3ON
D10 1N4148
D11 1N4148
R157 680R
LED17 AMBER
DGND

AFL3_SW
DGND
SW9

IC15 NE5532

C43 33PF 100V
R126 30K
R127 30K
MTX_RET-
MTX_RET+
R124 10K
IC14 TL072
R125 10K
C45 47UF 25V
C44 100PF 100V
VR8 20KK
R129 4K7
R128 4K7 NF
R130 3K9
TR5 J111
TR6 J111
R153 4K7
R152 4K7
MTX_METER
C46 47UF 25V
IC15 NE5532
R131 150K

C47 33PF 100V
R132 4K7
R136 10K
IC16 NE5532
R140 68R
C51 100UF 10V
MTX_OUT-
R133 4K7
R137 10K
C48 33PF 100V
C49 33PF 100V
R142 2K2
R144 100K
R134 4K7
R138 10K
R141 68R
R143 2K2
R145 100K
R135 4K7
R139 10K
IC16 NE5532
C52 100UF 10V
MTX_OUT+
C50 33PF 100V

+VA -VA
IC13 NE5532
IC14 TL072
IC15 NE5532
IC16 NE5532
C53 100N 63V
C54 100N 63V

MUTE_SW2
DGND
SW8
R146 100K
+VB
LG
R147 10K
R150 10K
C55 100N 63V
MUTE2
IC17 LM393
R151 470K
R149 1M
R148 470R
LED14 RED
LED15 RED
-VB
MUTE

+VB
IC17 LM393
-VB

D36

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NOTES

VR4 20KK
VR5 20KK
VR6 20KK
VR7 20KK
VR8 20KK

DRN. MG

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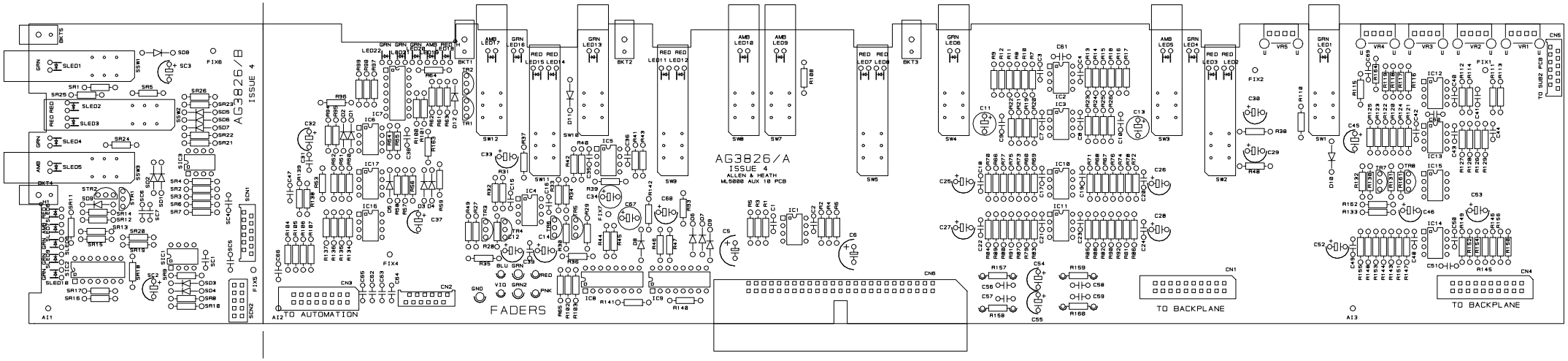
KERNICK INDUSTRIAL EST
PENRYN
CORNWALL
TR10 9LU
TEL: 01326 372070
FAX: 01326 377097

TITLE
ML5000
GROUP 2 TO 8

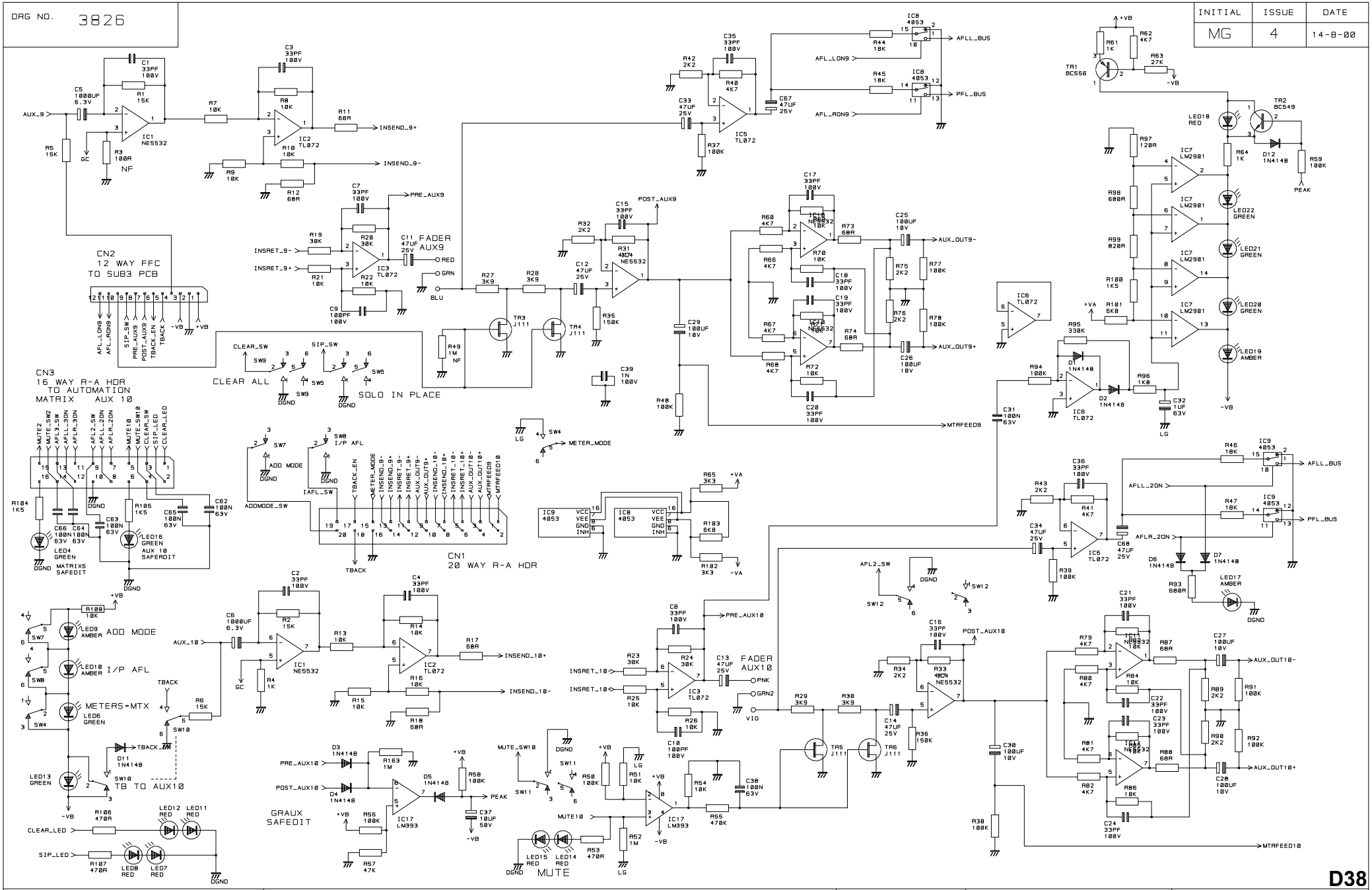
DRG NO. 3824


AG3826/B
ISSUE 4
AG3826/A
ISSUE 4
ALLEN & HEATH
MLS808 AUX 16 PCB
FADERS
TO AUTOMATION
TO BACKPLANE
TO BACKPLANE
TO SUB2 PCB

D37

DRG NO.	3826

INITIAL	ISSUE	DATE
MG	4	14-8-00



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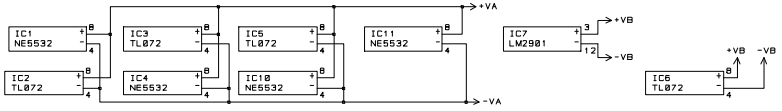


DRN.	MG

ALLEN & HEATH
KERNICK INDUSTRIAL EST
PENRYN
CORNWALL
TR10 9LU
TEL: 01326 372070
FAX: 01326 377097

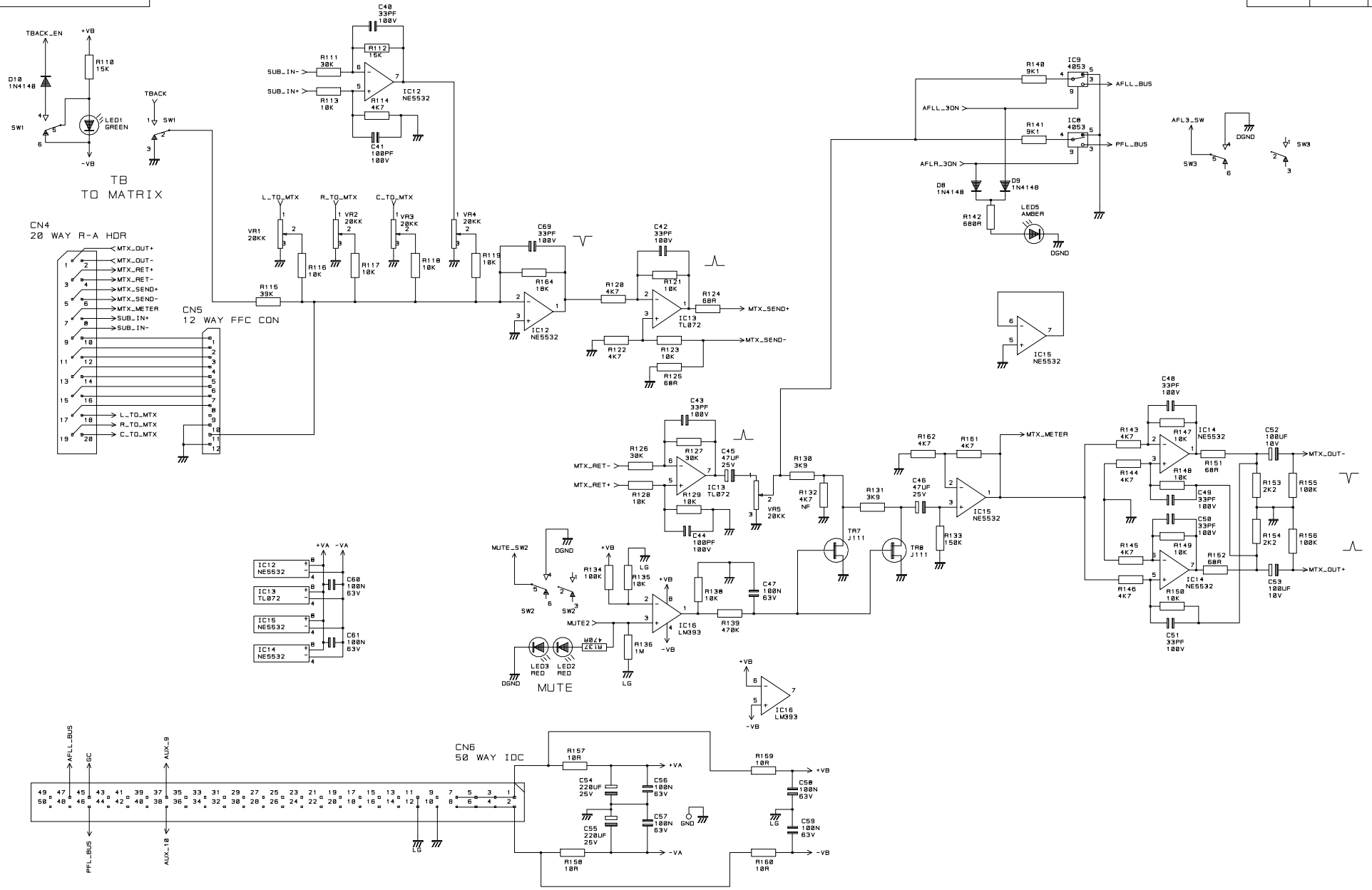
TITLE
ML5000
AUX 10 PCB

DRG NO.
3826

SHT. 1 OF 3

DRG NO.	3826

INITIAL	ISSUE	DATE
MG	4	14-8-00



D39□

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NOTES

VR1 20KK VR2 20KK VR3 20KK VR4 20KK VR5 20KK

DRN. MG

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KERNICK INDUSTRIAL EST
PENRYN
CORNWALL
TR10 9LU
TEL: 01326 372070
FAX: 01326 377097

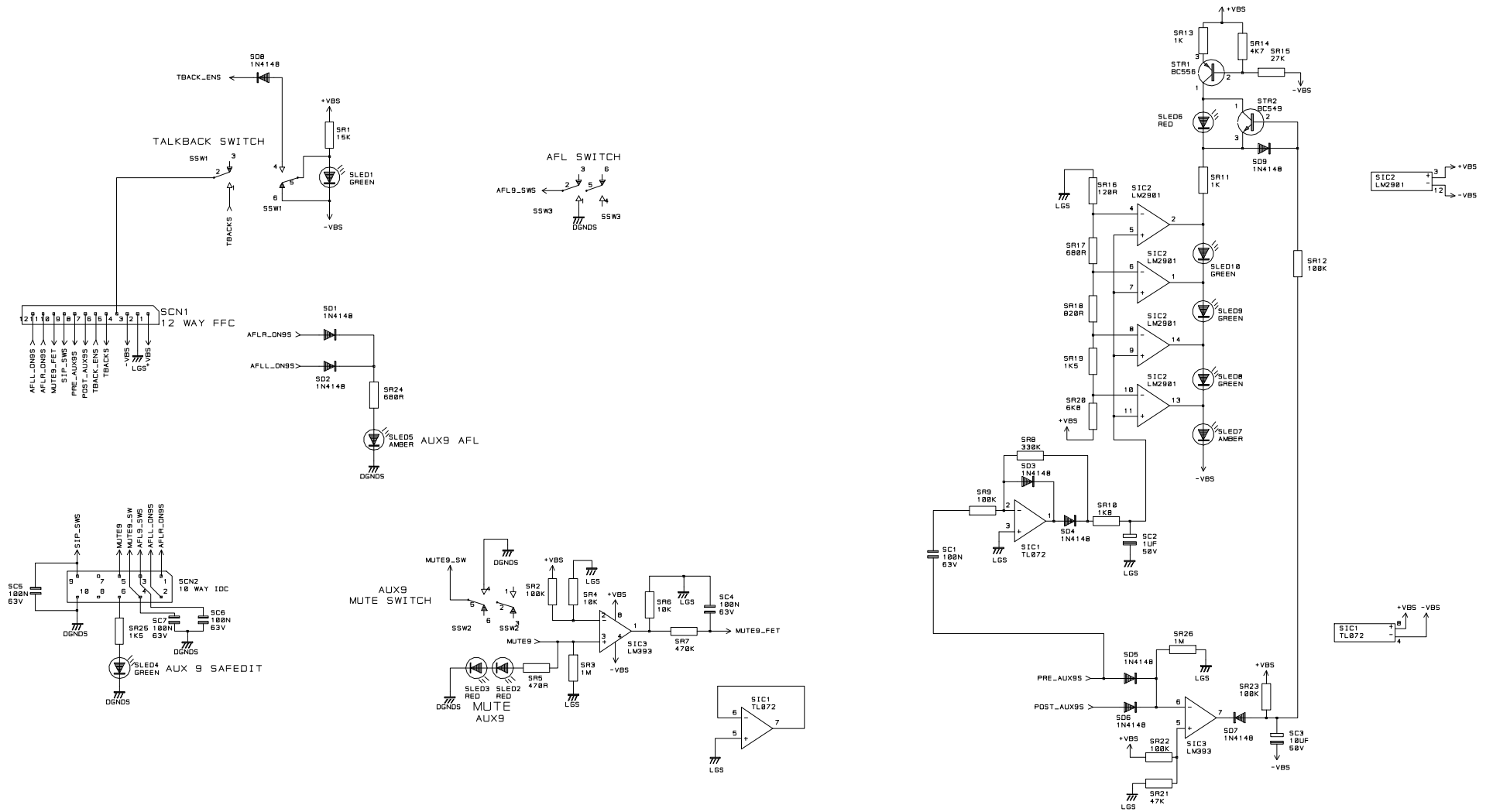
TITLE
ML5000
AUX 10 PCB

DRG NO. 3826

SHT. 2 OF 3

DRG NO.	3826

INITIAL	ISSUE	DATE
MG	4	14-8-00



D40

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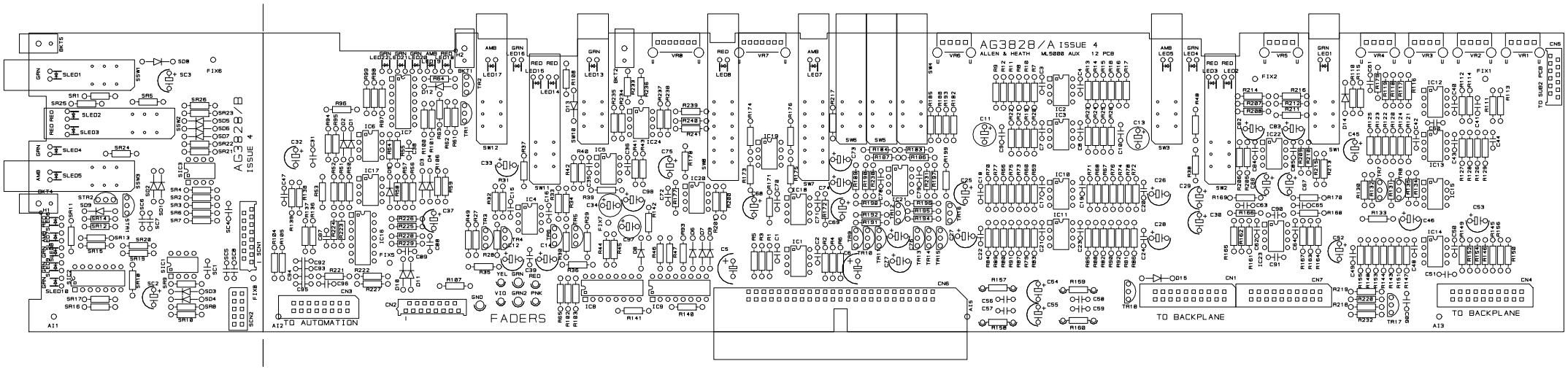
CORNWALL
TR10 9LU
TEL: 01326 372070
FAX: 01326 377097

TITLE
ML5000
AUX 10 PCB

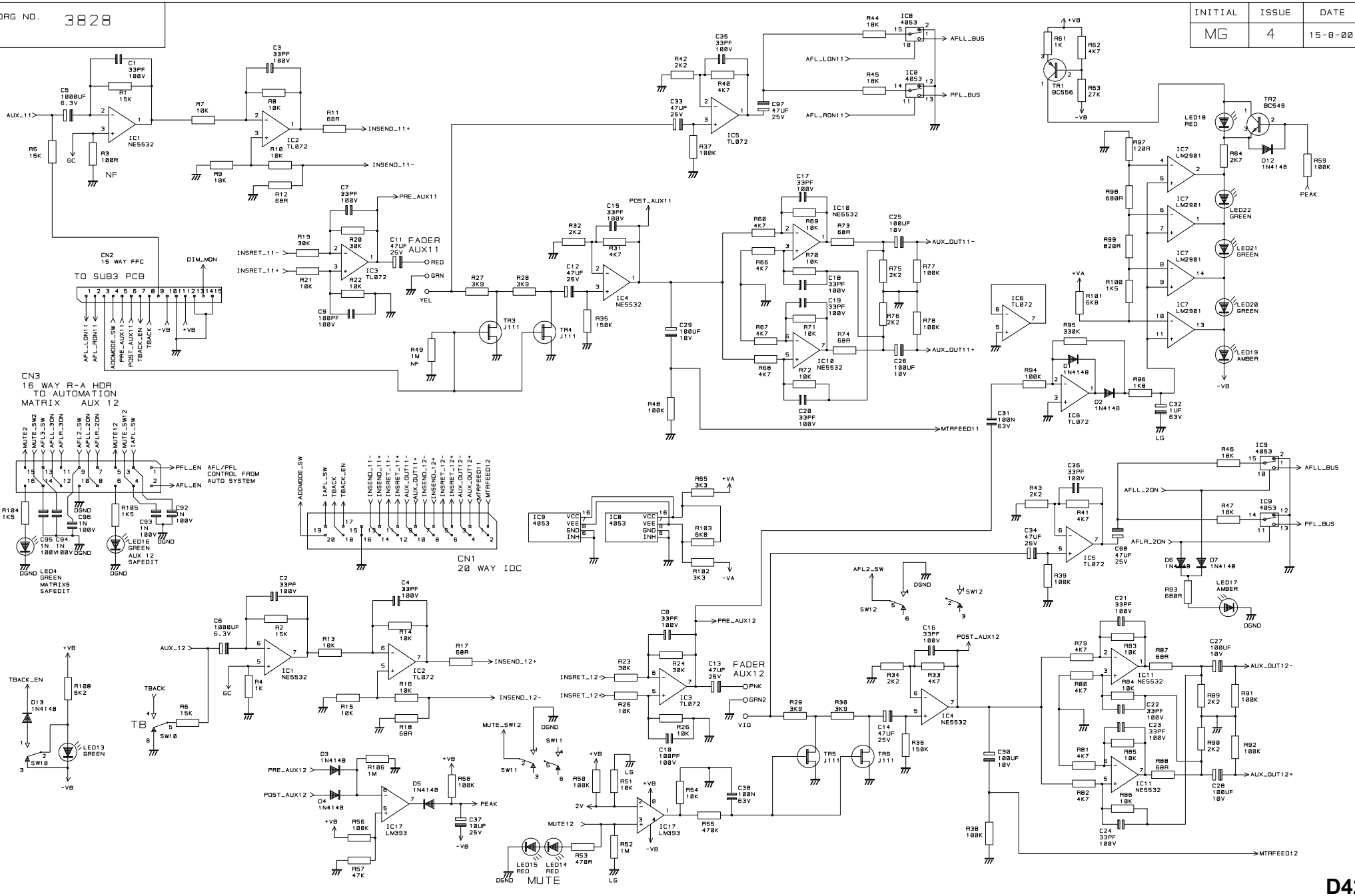
DRG NO. 3826


AG3828/A ISSUE 4
ALLEN & HEATH MLS800 AUX 12 PCB
FADERS
TO AUTOMATION
TO BACKPLANE
TO BACKPLANE
TO SUB2 PCB

D41

DRG NO.	3828

INITIAL	ISSUE	DATE
MG	4	15-8-00



D42

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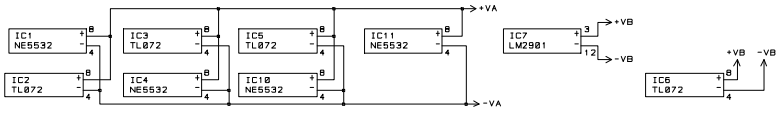
NOTES



DRN. MG

ALLEN & HEATH
KERNICK INDUSTRIAL EST
PENRYN
CORNWALL
TR10 9LU
TEL: 01326 372070
FAX: 01326 377097

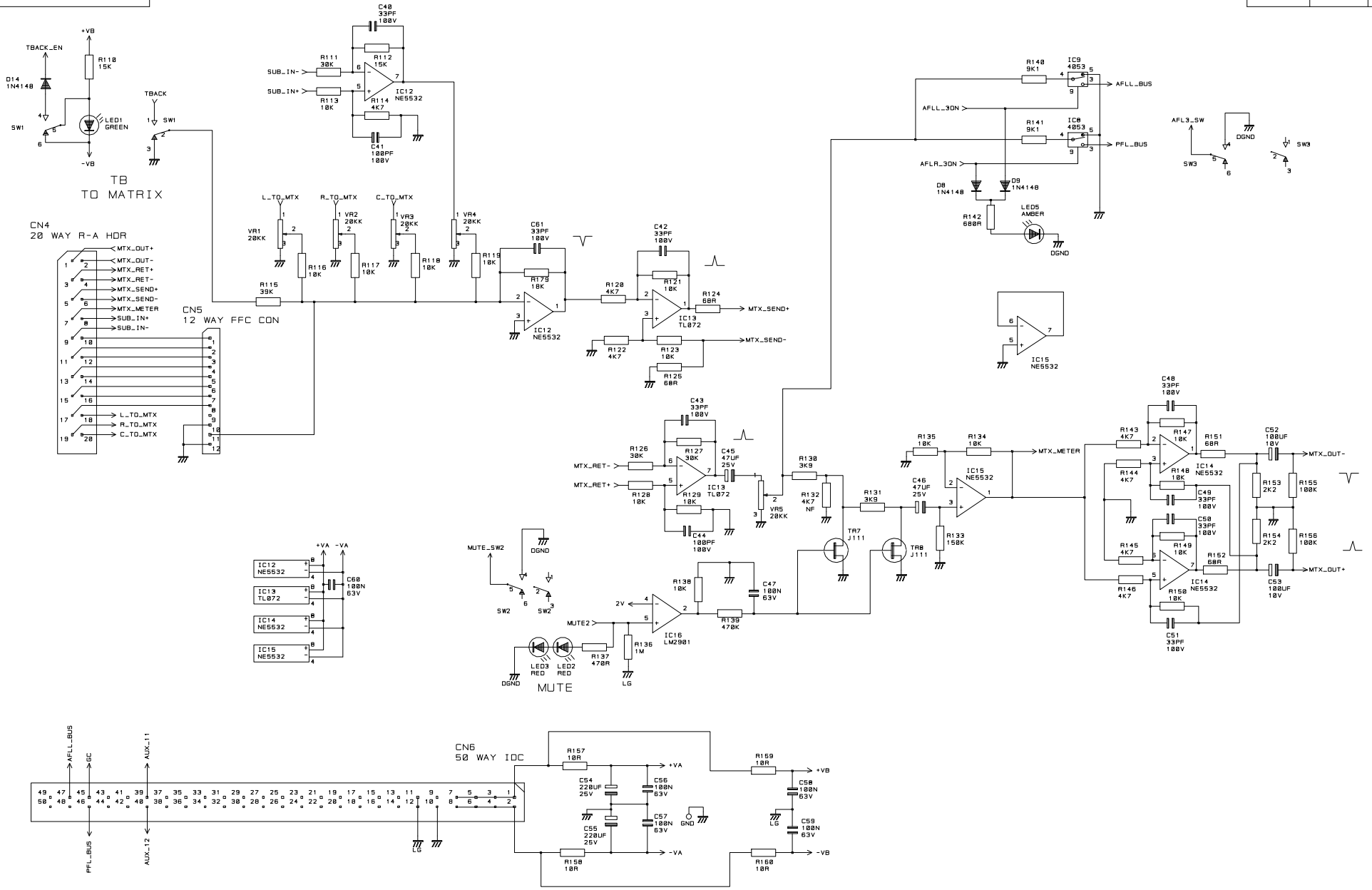
TITLE
ML5000
AUX 12 PCB

DRG NO. 3828

SHT. 1 OF 4

DRG NO.	3828

INITIAL	ISSUE	DATE
MG	4	15-8-00



D43

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NOTES

VR1 20KK VR2 20KK VR3 20KK VR4 20KK VR5 20KK

DRN.	MG

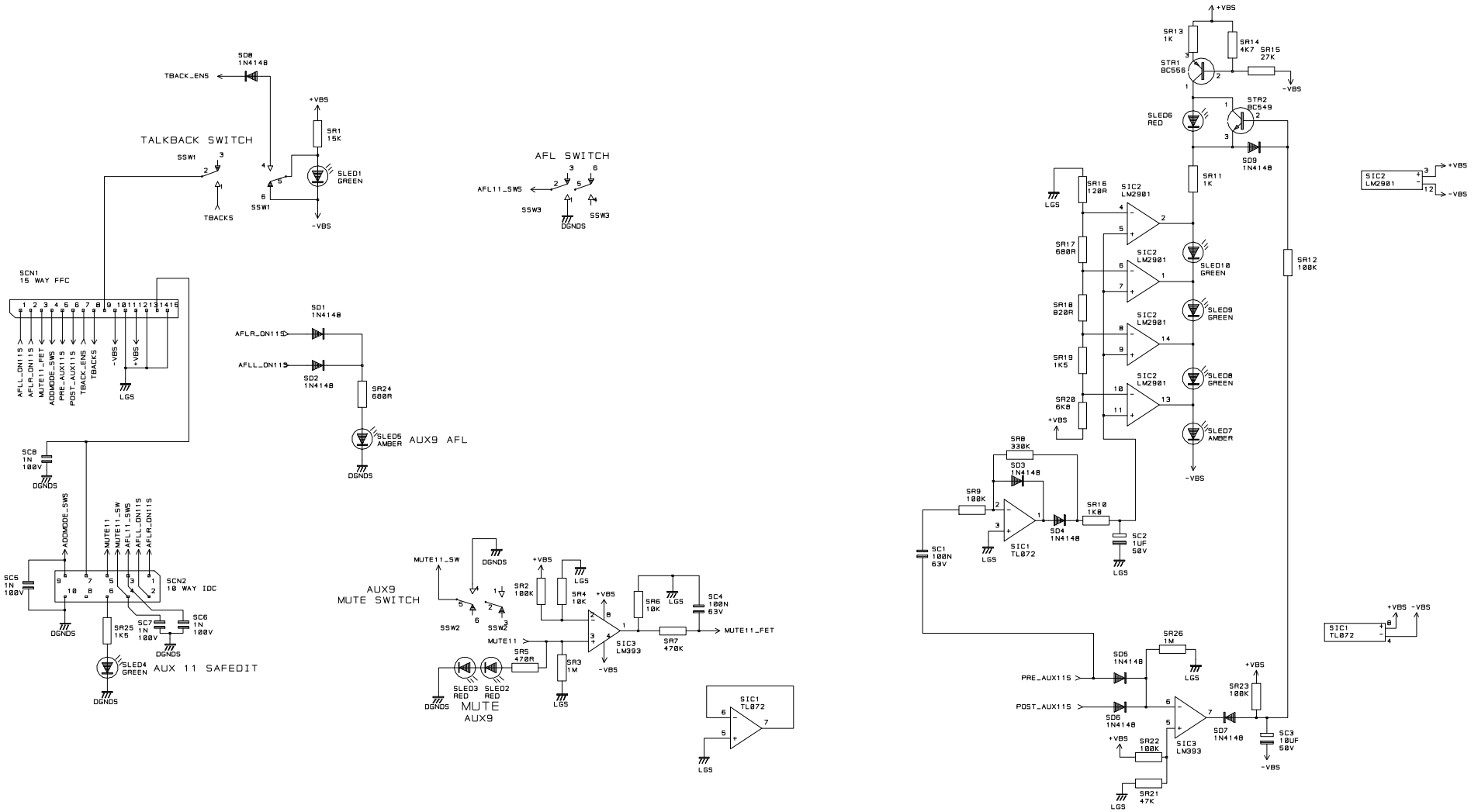
ALLEN & HEATH
KERNICK INDUSTRIAL EST
PENRYN
CORNWALL
TR10 9LU
TEL: 01326 372070
FAX: 01326 377097

TITLE
ML5000
AUX 12 PCB

DRG NO. 3828

DRG NO.	3828

INITIAL	ISSUE	DATE
MG	4	15-8-00



D44

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NOTES

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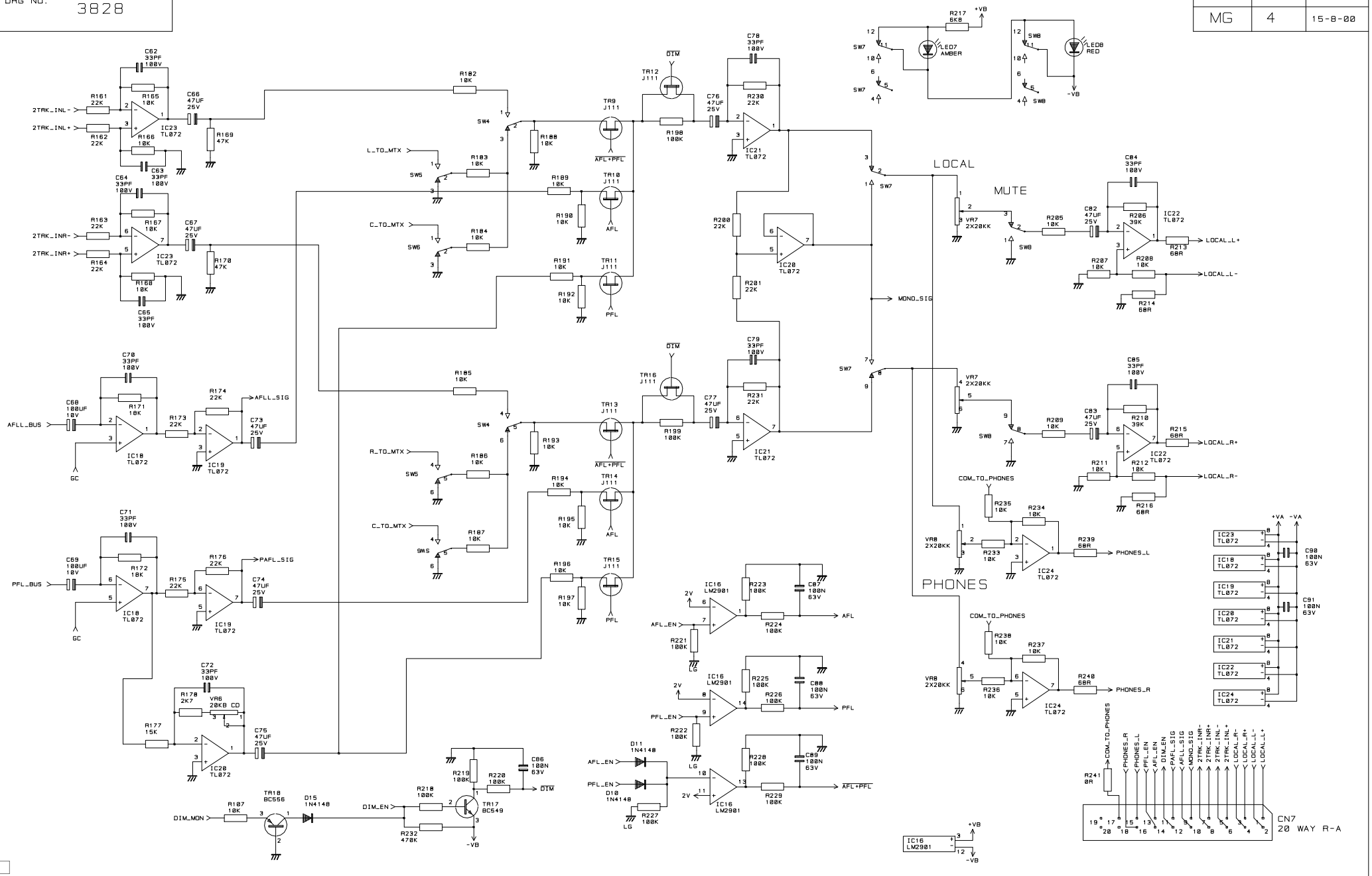
PENRYN
CORNWALL
TR10 9LU
TEL: 01326 372070
FAX: 01326 377097

TITLE
ML5000
AUX 12 PCB

DRG NO. 3828

DRG NO.	3828

INITIAL	ISSUE	DATE
MG	4	15-8-00



D45□

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NOTES

VR6 20KB CD
VR7 2X20KK
VR8 2X20KK

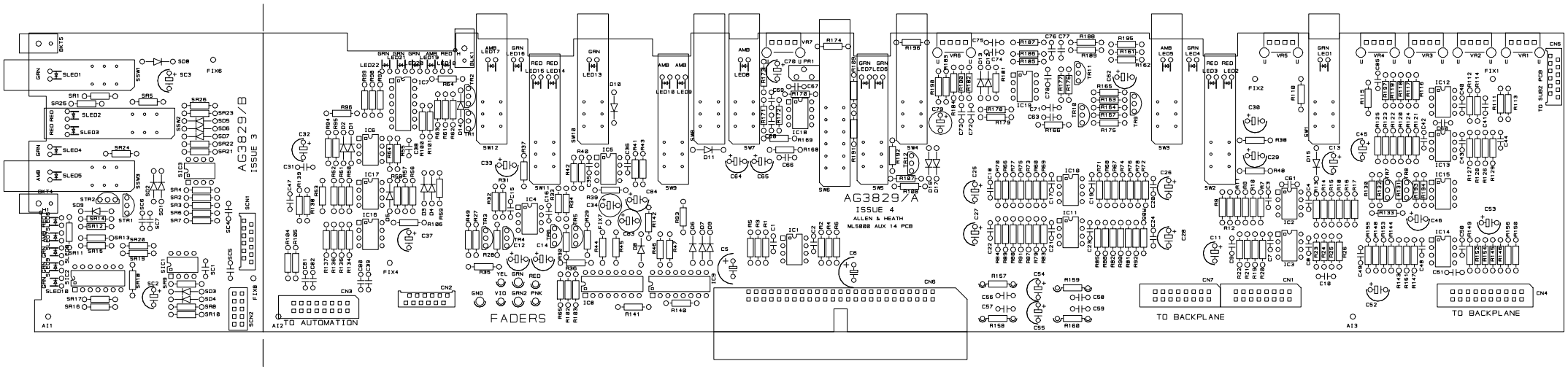
DRN. MG

ALLEN & HEATH
KERNICK INDUSTRIAL EST
PENRYN
CORNWALL
TR10 9LU
TEL: 01326 372070
FAX: 01326 377097

TITLE
ML5000
AUX 12 PCB

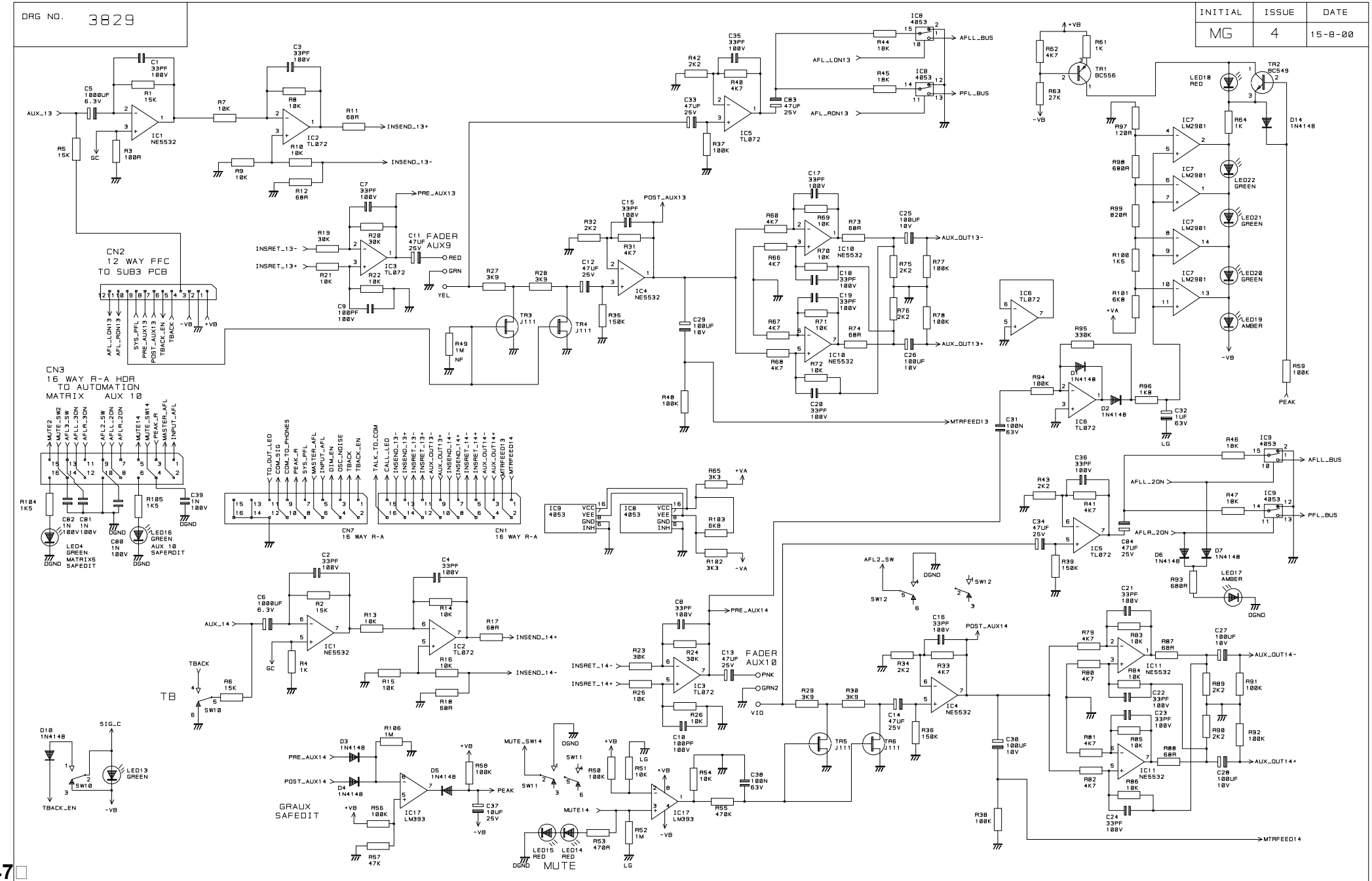
DRG NO. 3828

SHT. 4 OF 4


AG3829/B
ISSUE 3
AG3829/A
ISSUE 4
ALLEN & HEATH
ML5000 AUX 14 PCB
FADERS
TO AUTOMATION
TO BACKPLANE
TO BACKPLANE
TO SUB2 PCB

DRG NO.	3829

INITIAL	ISSUE	DATE
MG	4	15-8-00



D47□

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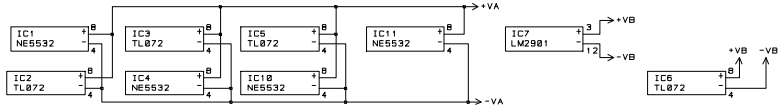
NOTES



DRN. MG

ALLEN & HEATH
KERNICK INDUSTRIAL EST
PENRYN
CORNWALL
TR10 9LU
TEL: 01326 372070
FAX: 01326 377097

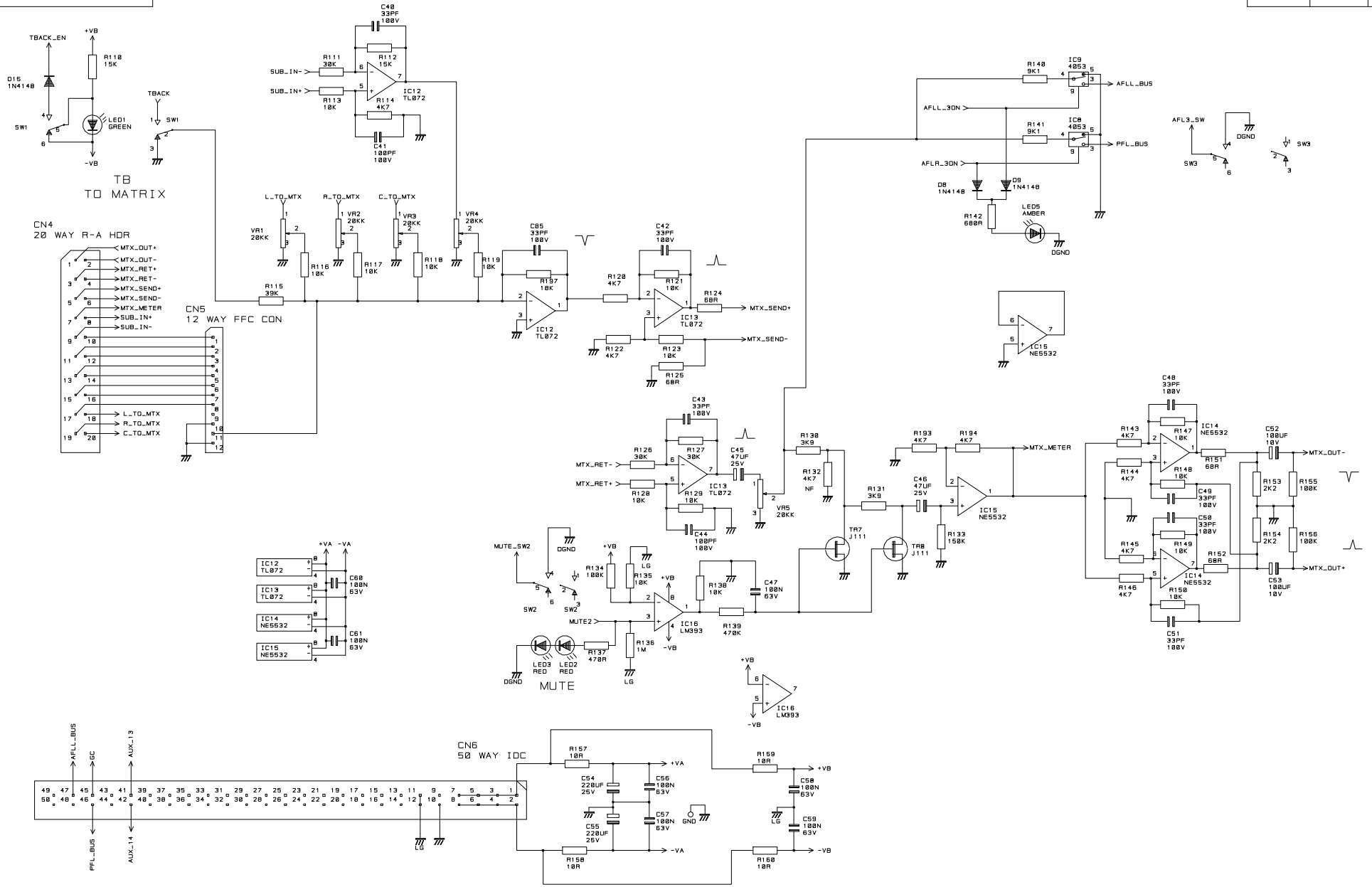
TITLE
ML5000
AUX 14 PCB

DRG NO.
3829

SHT. 1 OF 4

DRG NO.	3829

INITIAL	ISSUE	DATE
MG	4	15-8-00



D48

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NOTES

VR1 20KK VR2 20KK VR3 20KK VR4 20KK VR5 20KK

DRN.	MG

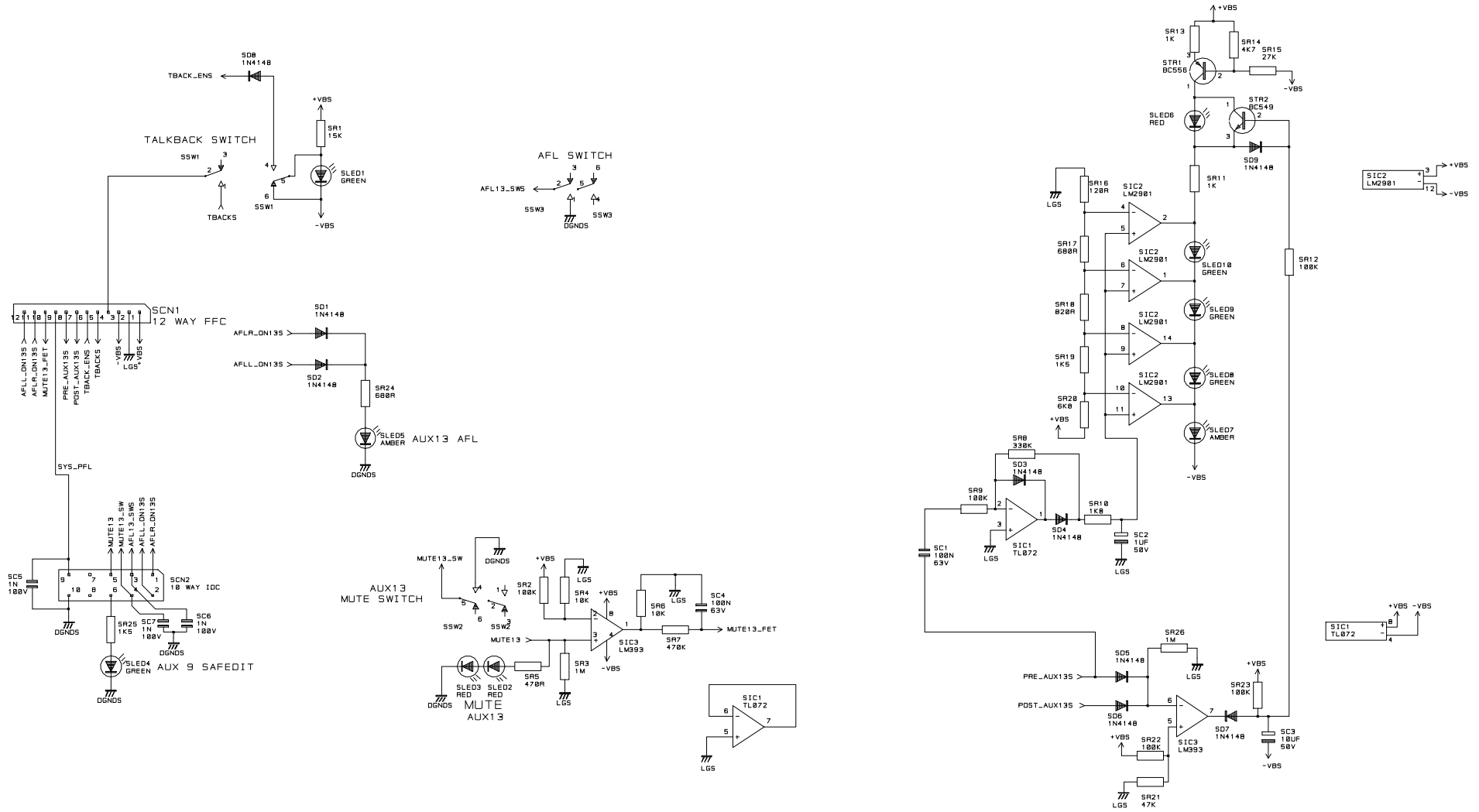
ALLEN & HEATH
KERNICK INDUSTRIAL EST
PENRYN
CORNWALL
TR10 9LU
TEL: 01326 372070
FAX: 01326 377097

TITLE
ML5000
AUX 14 PCB

DRG NO. 3829

DRG NO.	3829

INITIAL	ISSUE	DATE
MG	4	15-8-00



D49□

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NOTES

DRN. MG

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KERNICK INDUSTRIAL EST
PENRYN
CORNWALL
TR10 9LU
TEL: 01326 372070
FAX: 01326 377097

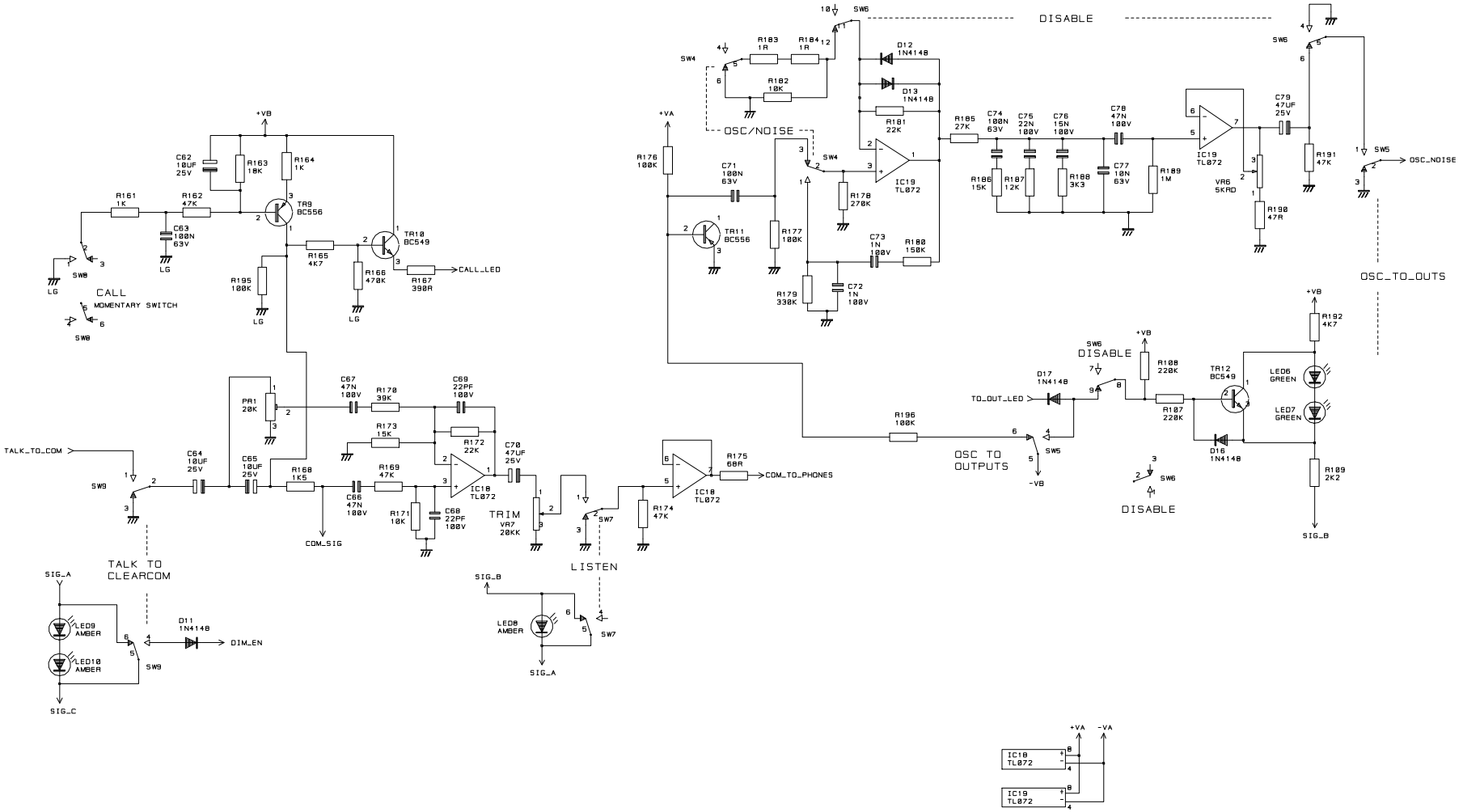
TITLE
ML5000
AUX 14 PCB

DRG NO. 3829

SHT. 3 OF 4

DRG NO.	3829

INITIAL	ISSUE	DATE
MG	4	15-8-00



D50

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NOTES

VR6 5KRD

VR7 20KK

DRN. MG

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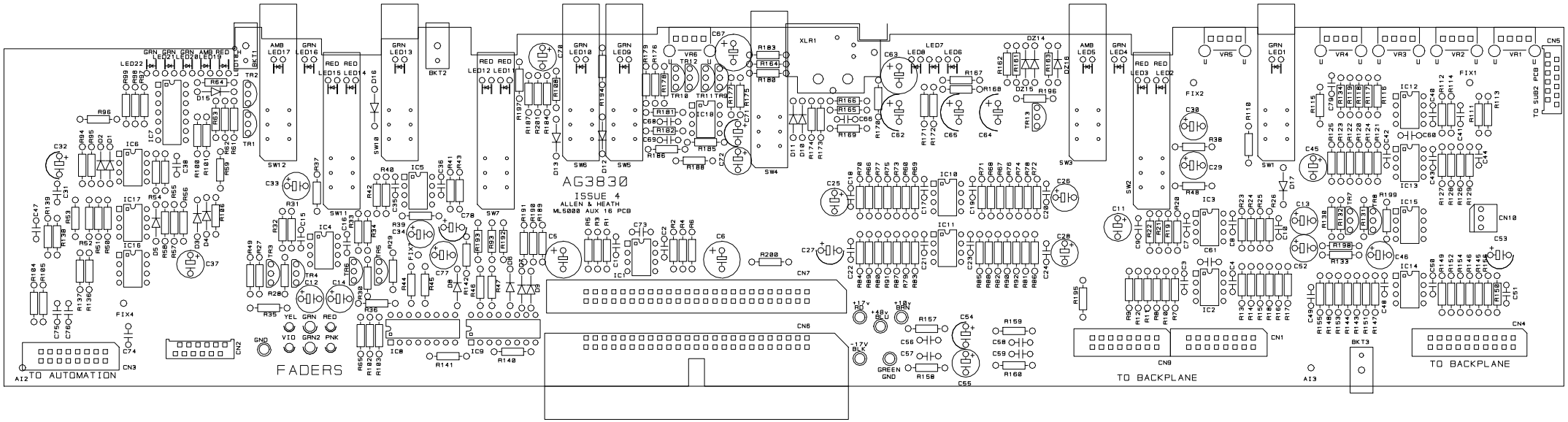
PENRYN
CORNWALL
TR10 9LU
TEL: 01326 372070
FAX: 01326 377097

TITLE
ML5000
AUX 14 PCB

DRG NO. 3829

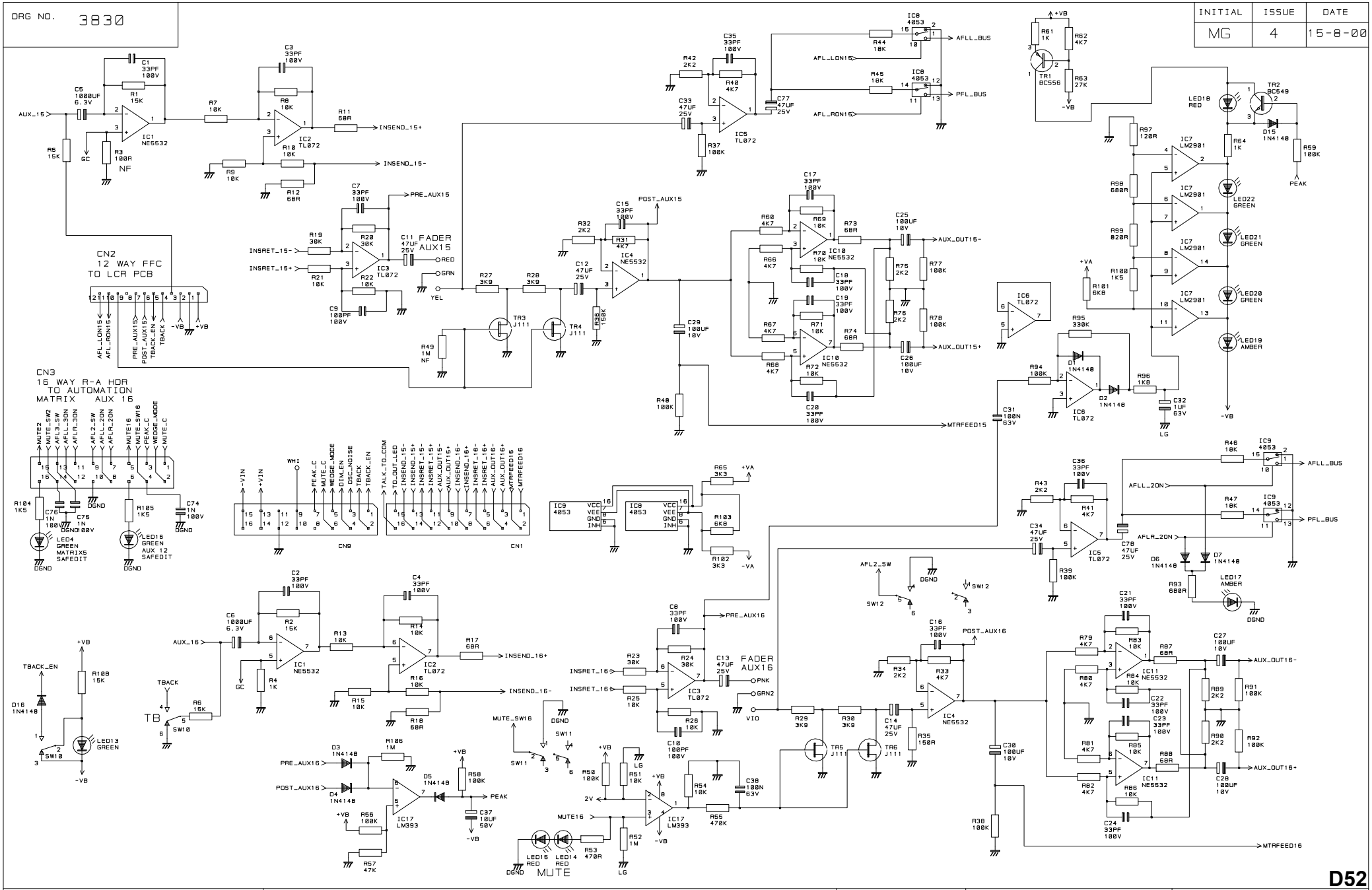
SHT. 4 OF 4


AG3830
ISSUE 4
ALLEN & HEATH
ML5000 AUX 16 PCB
FADERS
TO AUTOMATION
TO BACKPLANE
TO BACKPLANE
TO SUB2 PCB

D51

DRG NO.	3830

INITIAL	ISSUE	DATE
MG	4	15-8-00



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DRN.	MG

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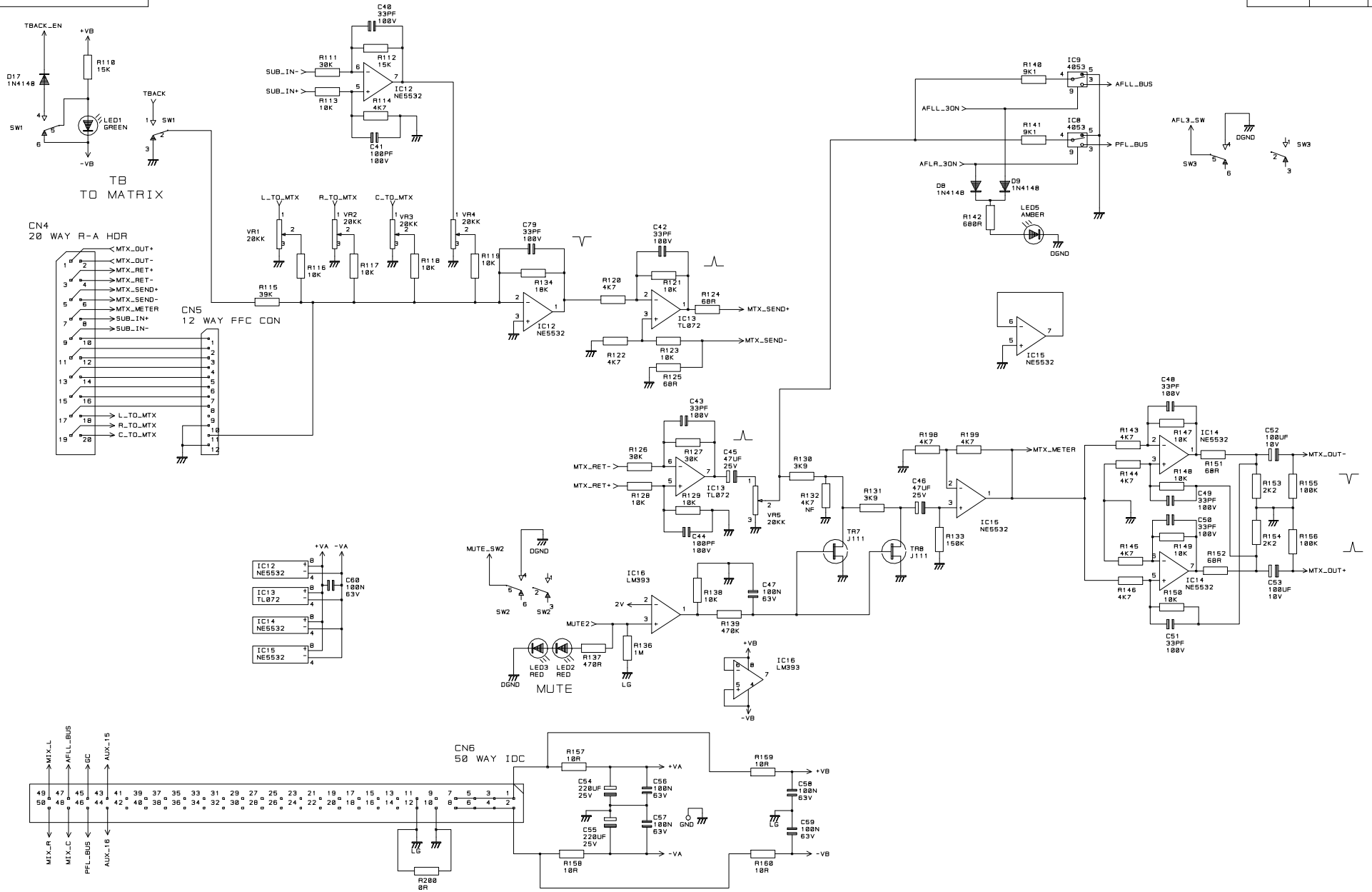
KERNICK INDUSTRIAL EST
PENRYN
CORNWALL
TR10 9LU
TEL: 01326 372070
FAX: 01326 377097

TITLE
ML5000
AUX 16 PCB

DRG NO. 3830

DRG NO.	3830

INITIAL	ISSUE	DATE
MG	4	15-8-00



D53□

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NOTES

VR1 20KK VR2 20KK VR3 20KK VR4 20KK VR5 20KK

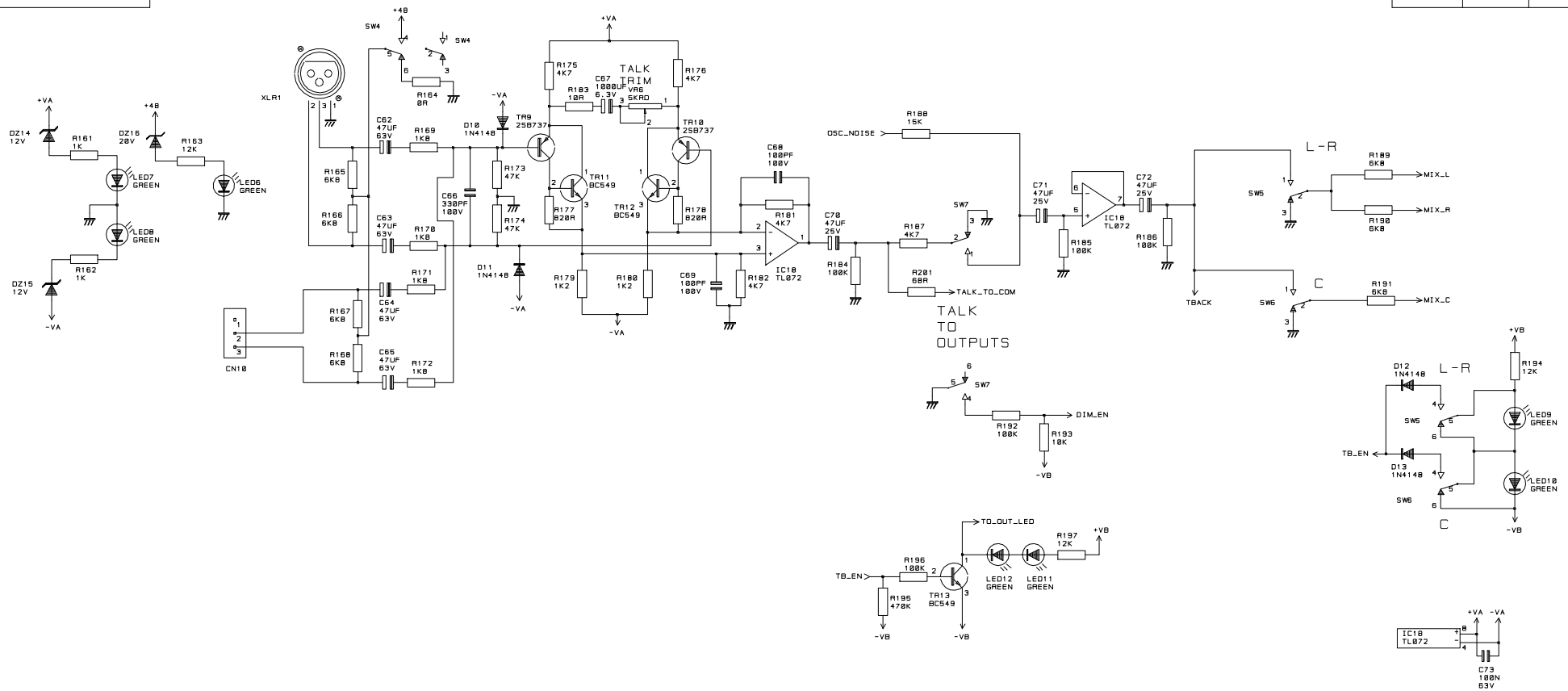
DRN.	MG

ALLEN & HEATH
KERNICK INDUSTRIAL EST
PENRYN
CORNWALL
TR10 9LU
TEL: 01326 372070
FAX: 01326 377097

TITLE
ML5000
AUX 16 PCB

DRG NO. 3830

DRG NO.	INITIAL	ISSUE	DATE
3830	MG	4	15-8-00



D54

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NOTES

VR6 5KRD

DRN. MG

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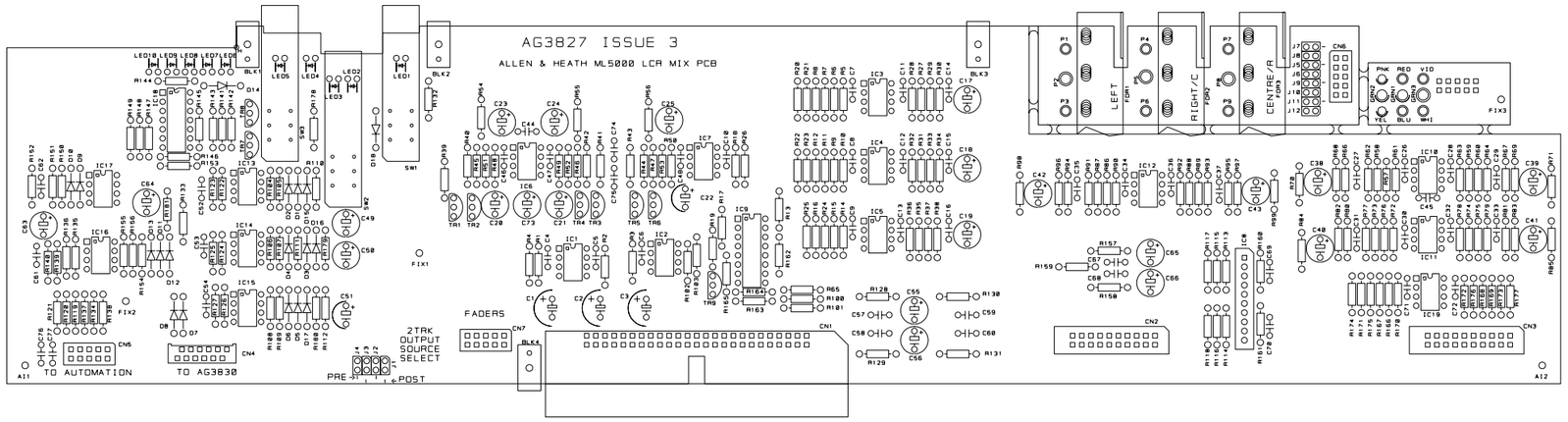
KERNICK INDUSTRIAL EST
PENRYN
CORNWALL
TR10 9LU
TEL: 01326 372070
FAX: 01326 377097

TITLE
ML5000
AUX 16 PCB

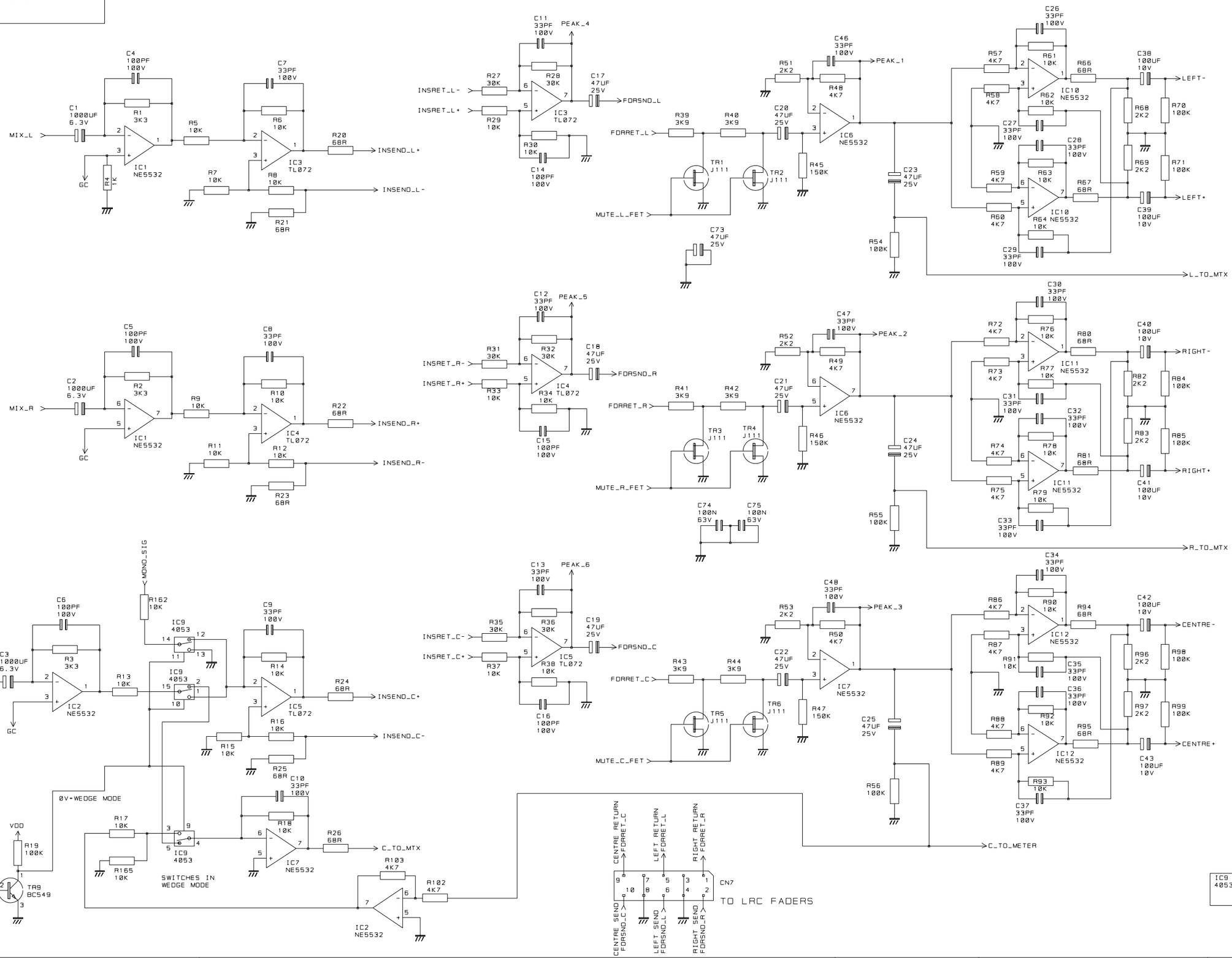
DRG NO. 3830


AG3827 ISSUE 3
ALLEN & HEATH ML5000 LCR MIX PCB
LEFT
RIGHT/C
CENTRE/R
TO AUTOMATION
TO AG3830
FADERS
2TRK
OUTPUT
SOURCE
SELECT
PRE
POST

D55

DRG NO.	3827

INITIAL	ISSUE	DATE
MG	2	28-4-00



D56

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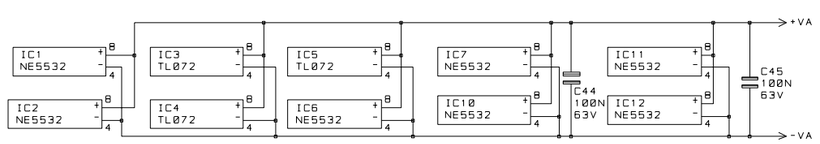


DRN. MG

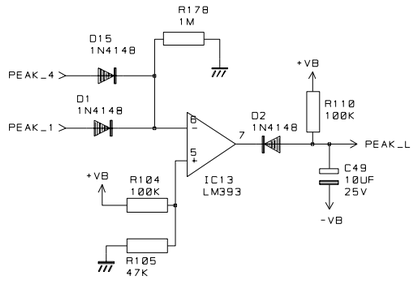
ALLEN & HEATH
KERNICK INDUSTRIAL EST
PENRYN
CORNWALL
TR10 9LU
TEL: 01326 372070
FAX: 01326 377097

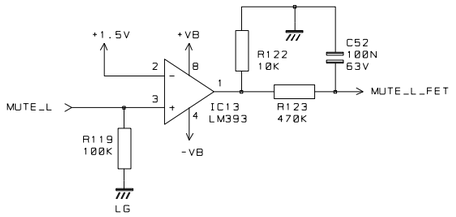
TITLE
ML5000
MIX LRC PCB

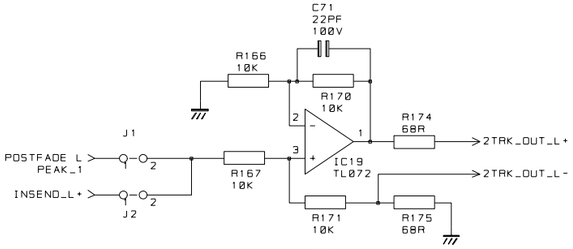
DRG NO.
3827

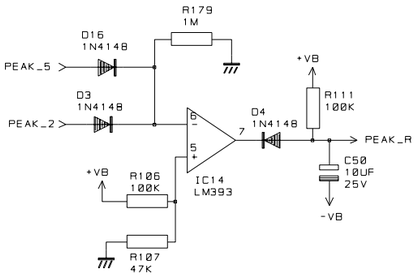
DRG NO.	3827

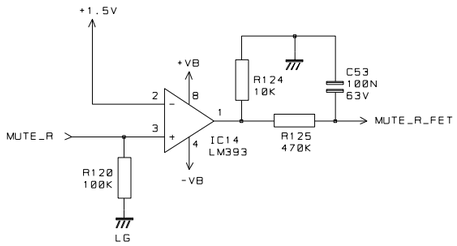
INITIAL	ISSUE	DATE
MG	2	28-4-00

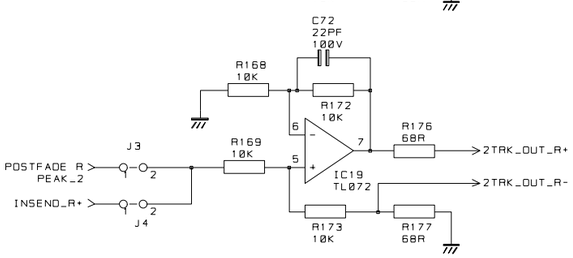


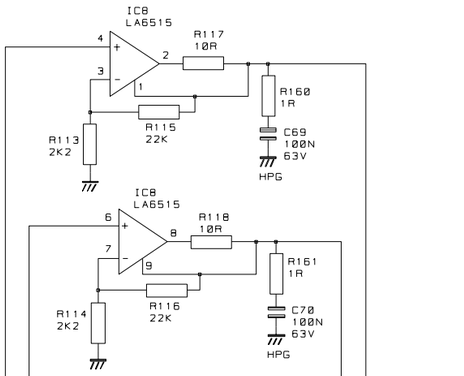


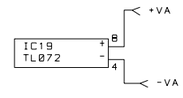


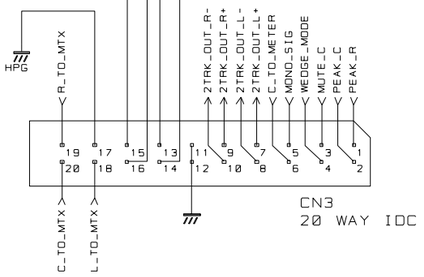


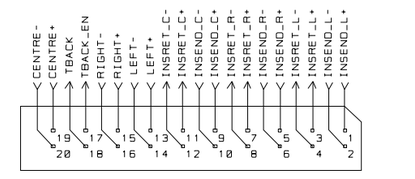


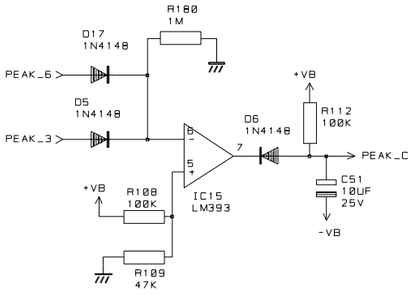


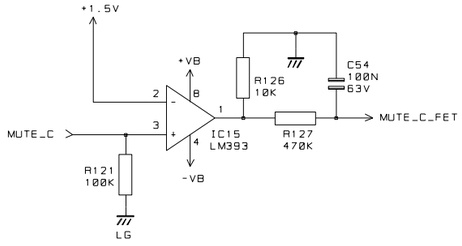


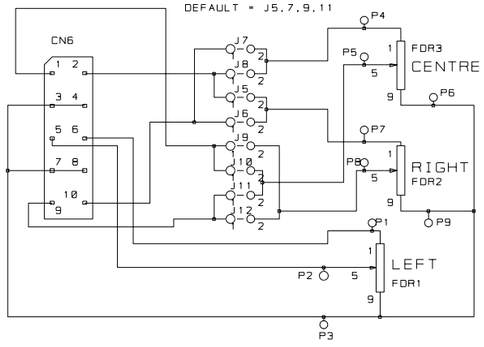


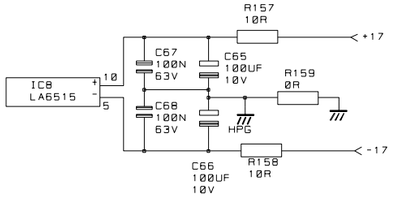


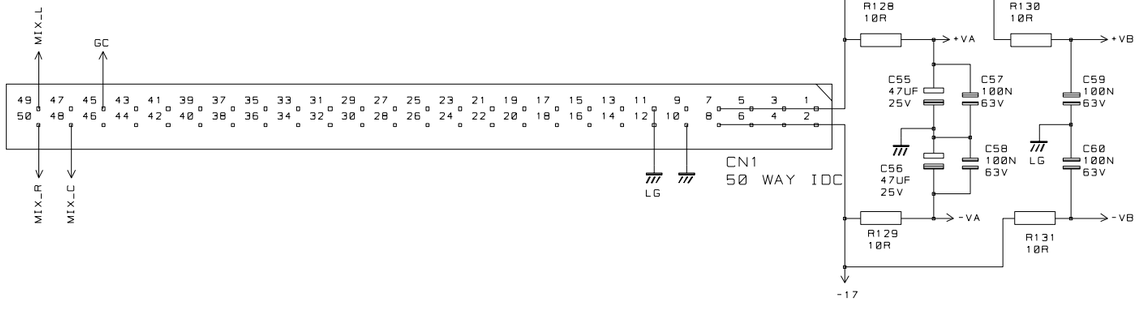












D57

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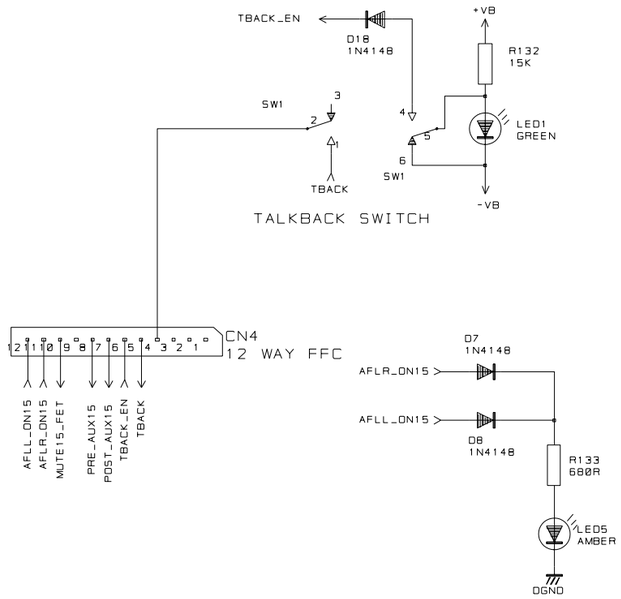
PENRYN
CORNWALL
TR10 9LU
TEL: 01326 372070
FAX: 01326 377097

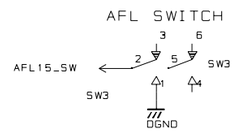
TITLE
ML5000
MIX LRC PCB

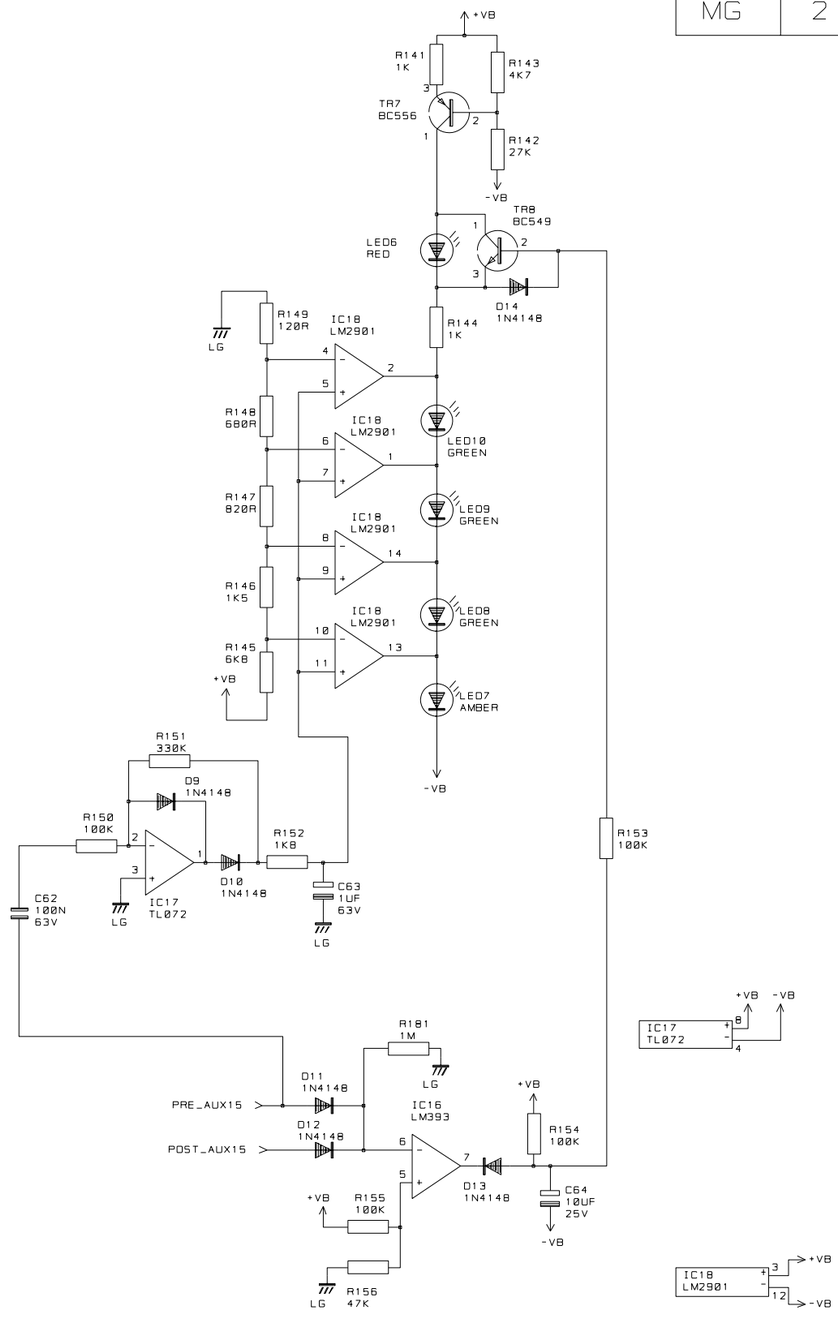
DRG NO. 3827

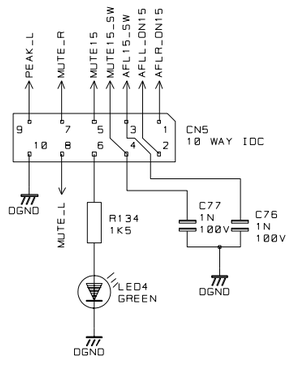
DRG NO.	3827

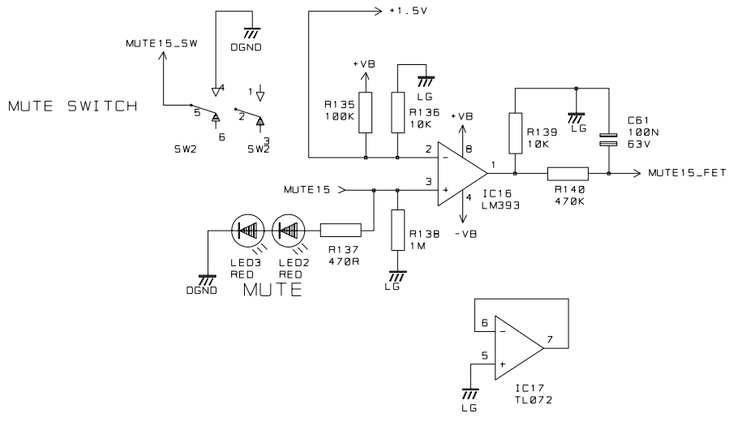
INITIAL	ISSUE	DATE
MG	2	28-4-00











D58

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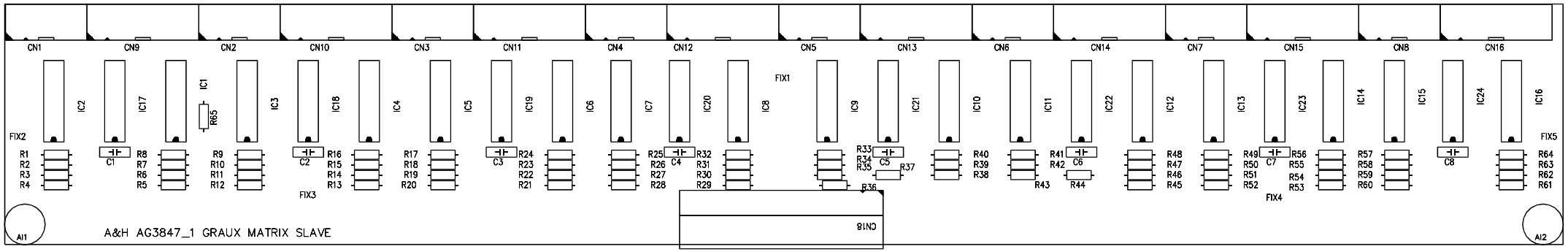
TITLE
ML5000
LRC PCB

DRG NO. 3827


CN1
CN9
CN2
CN10
CN3
CN11
CN4
CN12
CN5
CN13
CN6
CN14
CN7
CN15
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CN16
IC2
IC17
IC1
R65
IC3
IC18
IC4
IC5
IC19
IC6
IC7
IC20
IC8
IC9
IC21
IC10
IC11
IC22
IC12
IC13
IC23
IC14
IC15
IC24
IC16
FIX1
FIX2
FIX3
FIX4
FIX5
R1
R2
R3
R4
C1
R8
R7
R6
R5
R9
R10
R11
R12
C2
R16
R15
R14
R13
R17
R18
R19
R20
C3
R24
R23
R22
R21
R25
C4
R32
R31
R30
R29
R33
R34
R35
C5
R37
R36
R40
R39
R38
R41
R42
C6
R43
R44
R48
R47
R46
R45
R49
R50
R51
R52
C7
R56
R55
R54
R53
R57
R58
R59
R60
C8
R64
R63
R62
R61
CN18
A&H AG3847_1 GRAUX MATRIX SLAVE
AI1
AI2

D59

ISS	REVISION	BY	DATE
A	ORIGIN	GMR	2/8/99
B	CONNECTOR CHANGES	AAT	27/09/99
1	GROUND PLANE PCB (DGND)	AAT	02-12-99

NOTES
1. RESISTORS MARKED * ARE 1%
   ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED
2. ELECTROLYTIC CAPACITORS ARE uF/VOLTS
3.

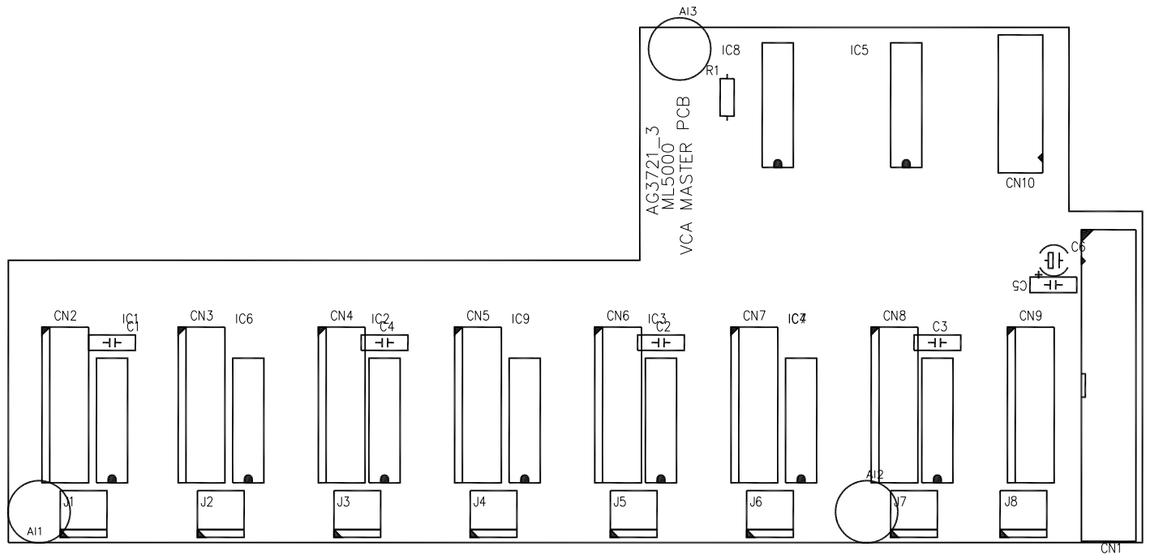
UNIT TITLE: ML5000

DRAWING TITLE: Graux Matrix Slave

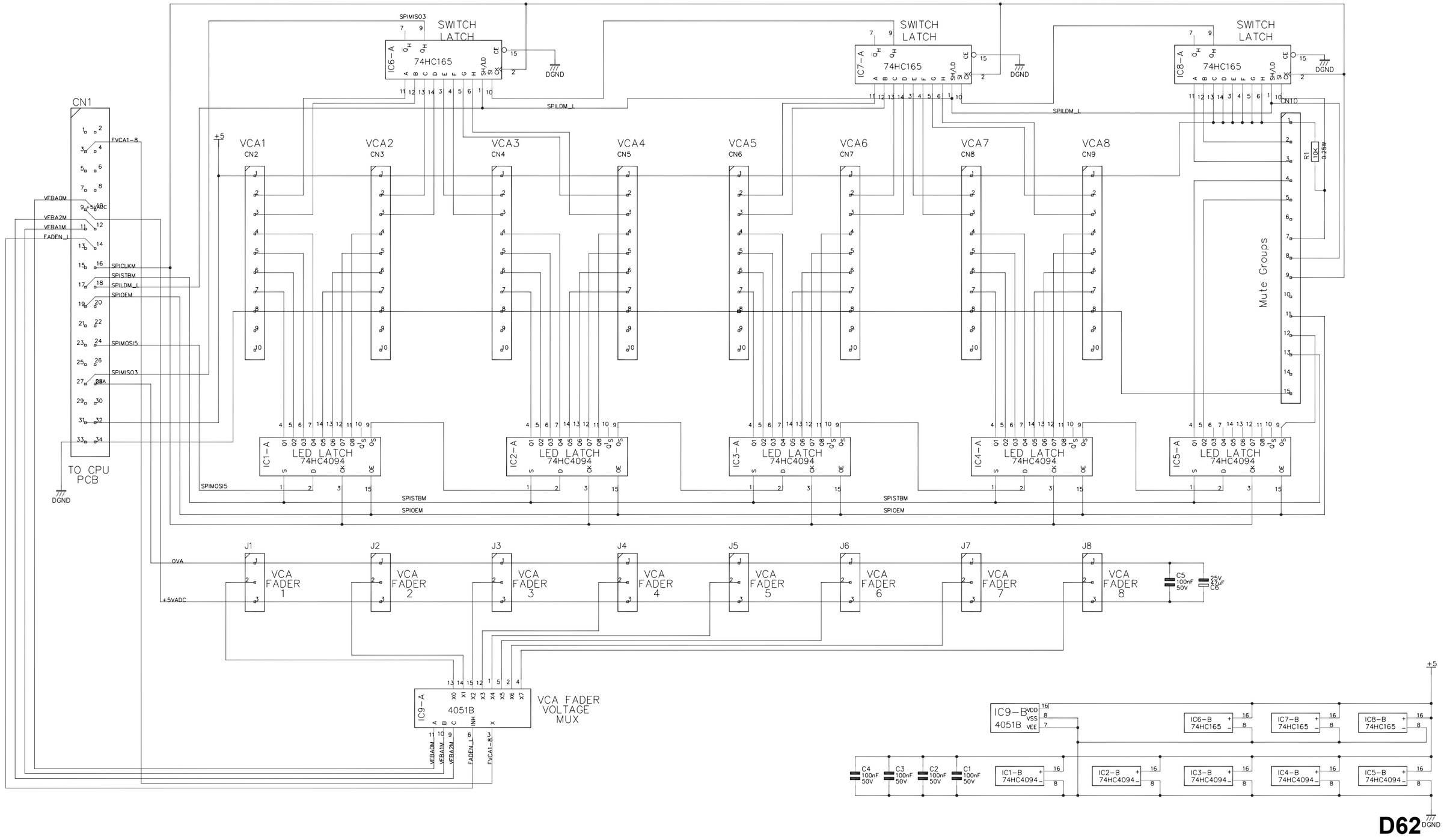
CIRCUIT DIAGRAM PCB AG 3847

ALLEN & HEATH **D60**
PENRYN, CORNWALL
ENGLAND, TR10 9LU

DRAWING No 3847 SHT 1 OF 1 ISSUE 1 A1


AI3
IC8
R1
IC5
CN10
AG3721_3
ML5000
VCA MASTER PCB
C6
C5
CN2
IC1
C1
CN3
IC6
CN4
IC2
C4
CN5
IC9
CN6
IC3
C2
CN7
IC4
CN8
C3
CN9
AI2
J1
J2
J3
J4
J5
J6
J7
J8
AI1
CN1

D61



D62

ISS	REVISION	BY	DATE
A	ORIGIN	GMR	11/8/99
B	IDC CHG +OTHER	AAT	13/10/99
1	GROUND PLANE ADDED TO PCB MOUNT	AAT	03-12-99
2	FADER CONN WIRING	AAT	28-02-00
3	PROFILE CHANGE FOR ML4000 FIT	AAT	20-11-00

NOTES
1. RESISTORS MARKED * ARE 1%
   ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED
2. ELECTROLYTIC CAPACITORS ARE uF/VOLTS
3.

UNIT TITLE: ML5000

DRAWING TITLE: VCA masters slave

CIRCUIT DIAGRAM PCB AG 3721

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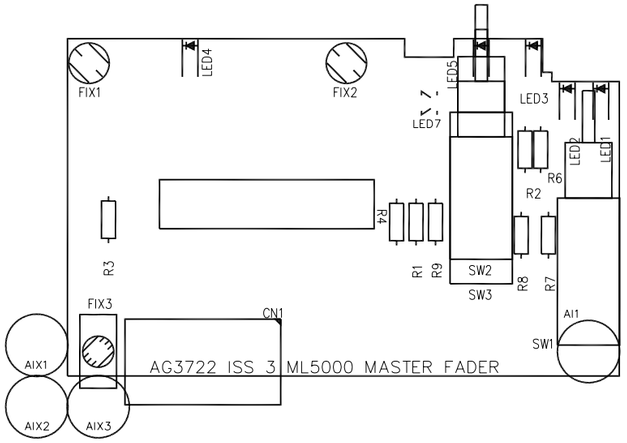
PENRYN, CORNWALL
ENGLAND, TR10 9LU

DRAWING No 3721 SHT 1 OF 1 ISSUE 3 A1

AIX8

ALLEN &HEATH ML5000 FADER PCB AG3722_3

AIX7



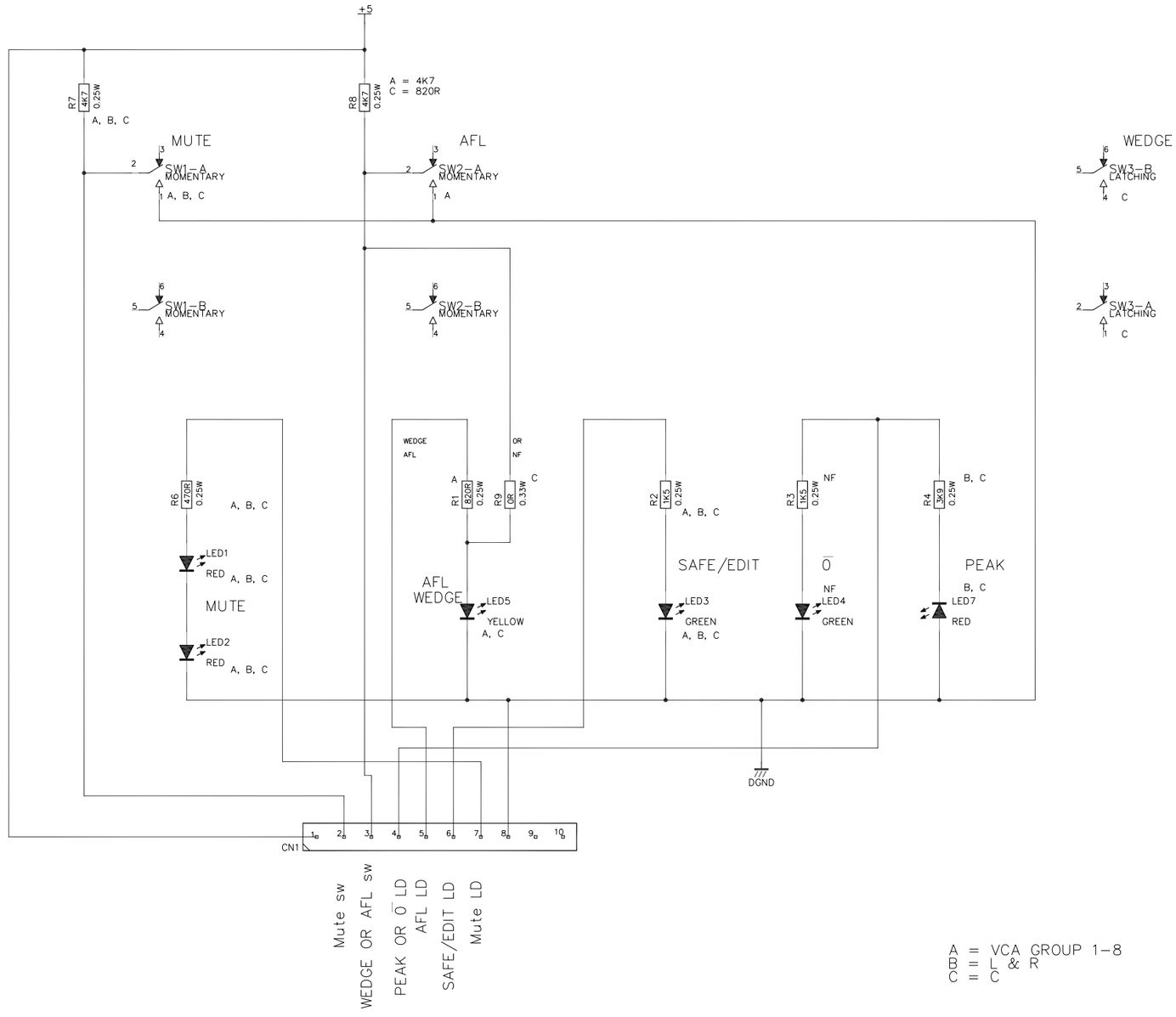
AG3722 ISS 3 TOP SILK 30-05-00

AIX6

AIX4

AIX5

D63



A = VCA GROUP 1-8
B = L & R
C = C

D64

ISS	REVISION	BY	DATE
A	ORIGIN	GMR	30/7/99
C	SWAP PINS 4,7 ON CN1	AAT	04-11-99
1	GROUND PLANE ADDED (DGND) TO MOUNTINGS	AAT	02-11-99
2	VALUES / ANNOTATION	AAT	28-02-00
3	FIXING HOLE ADJUSTMENT	AAT	30-05-00

NOTES
1. RESISTORS MARKED * ARE 1%
   ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED
2. ELECTROLYTIC CAPACITORS ARE uF/VOLTS
3.

UNIT TITLE: ML5000
DRAWING TITLE: Master Fader Circuit
CIRCUIT DIAGRAM PCB AG 3722

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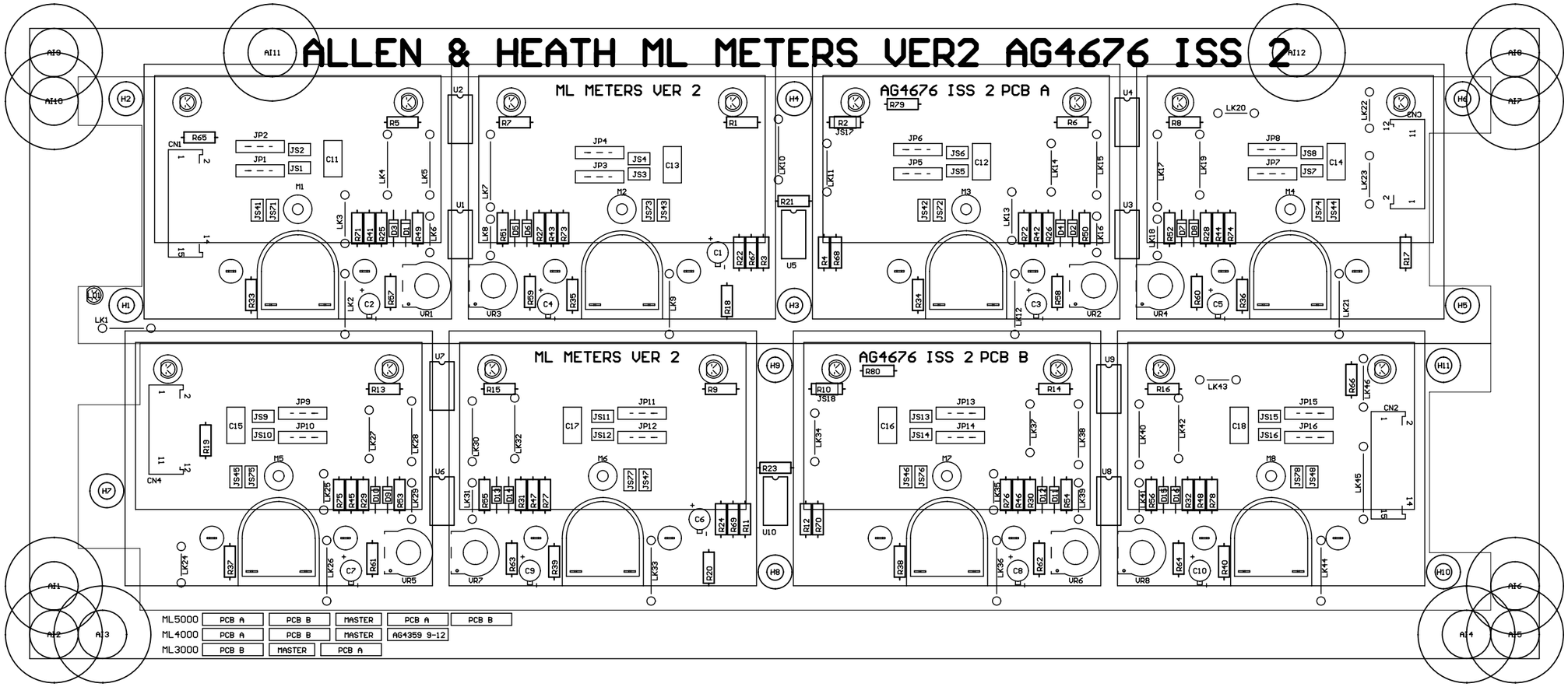
PENRYN, CORNWALL
ENGLAND, TR10 9LU

DRAWING No 3722 SHT 1 OF 1 ISSUE 3 A1

ALLEN & HEATH ML METERS VER2 AG4676 ISS 2


ML METERS VER 2
AG4676 ISS 2 PCB A
ML METERS VER 2
AG4676 ISS 2 PCB B
ML5000 PCB A PCB B MASTER PCB A PCB B
ML4000 PCB A PCB B MASTER AG4359 9-12
ML3000 PCB B MASTER PCB A

D65

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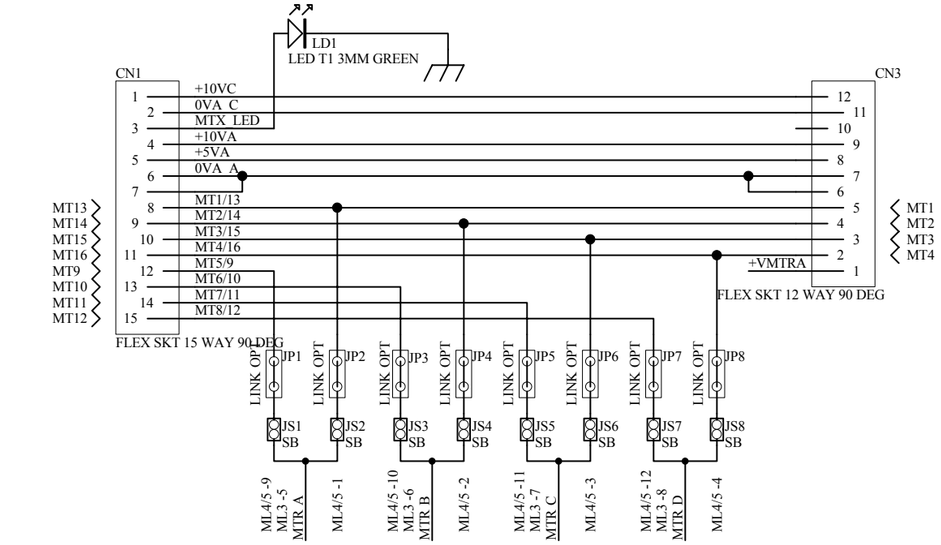
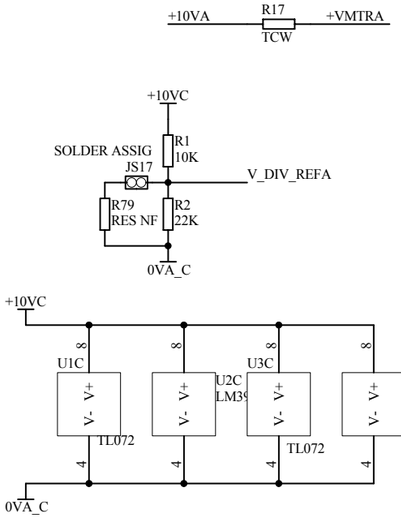
TOP OVERLAY .GTO

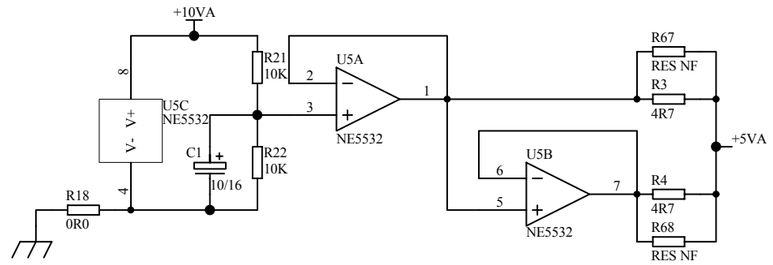
FILE: AG4676_2.PCB | PRINTED: 18:52:13 6-Dec-2002

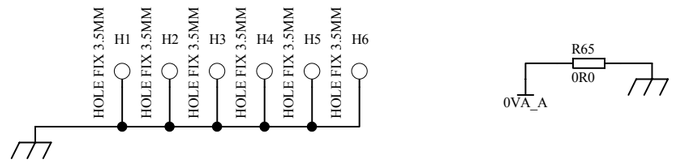
TITLE: ML METERS VER2 PCB

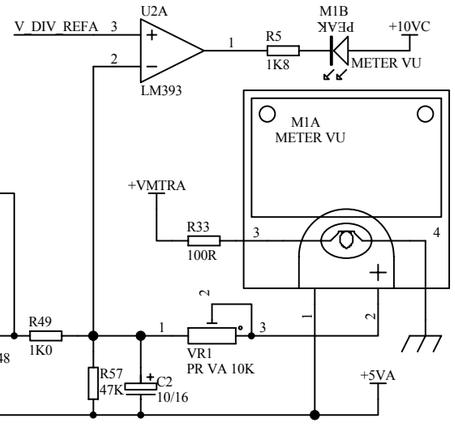
DRG No: AG4676 ISSUE: 2

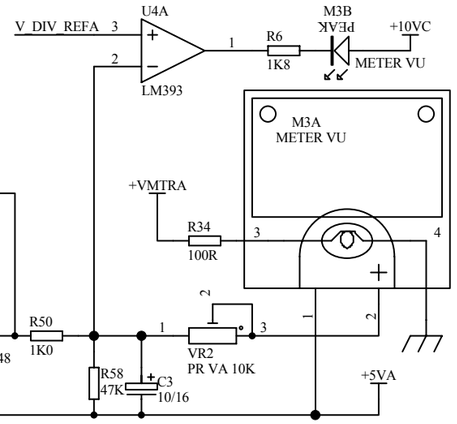


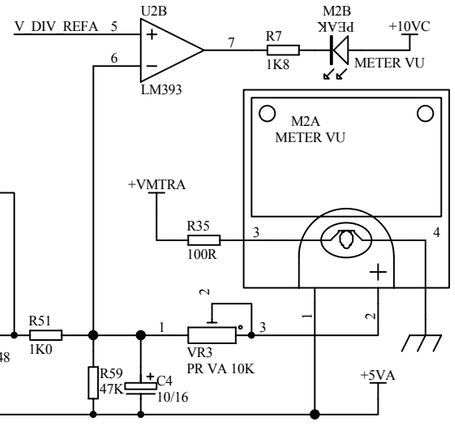


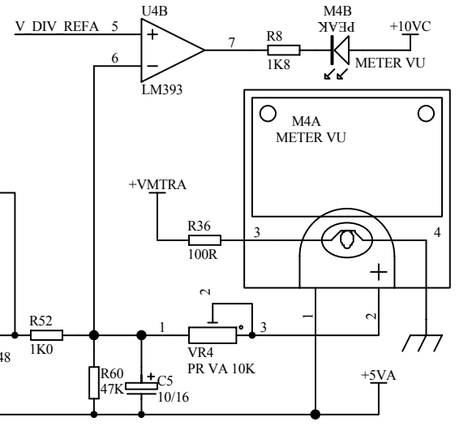












D66

ISSUE	BY	DATE
1	AAT	05-10-01
2	AAT	31-10-01

TITLE: ML METERS 1-8 & 9-16 VER2

PAGE: METERS 1-4 & 9-12

FILE: C4676P2_2.Sch | PRINTED:18:54:39 6-Dec-2002 | DRG No: C4676 | ISSUE: 2 | SHEET: 2 OF 4 | A3

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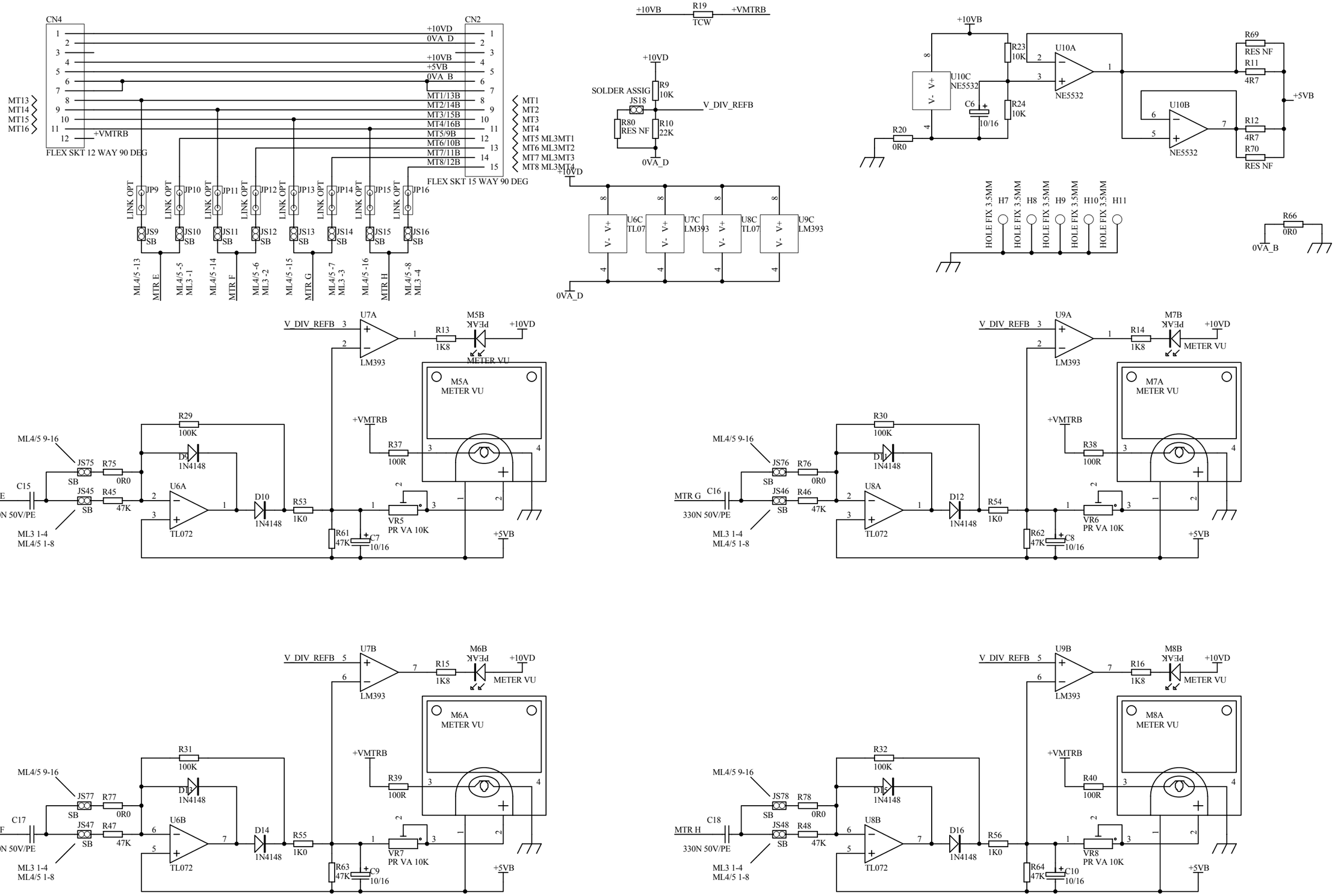

D67

ISSUE	BY	DATE
1	AAT	05-10-01
2	AAT	30-10-01

TITLE: ML METERS 1-8 & 9-16 VER2

PAGE: METERS 5-8 & 13-16

FILE: C4676P3_2.Sch

PRINTED:18:58:37 6-Dec-2002

DRG No: C4676

ISSUE: 2

SHEET: 3 OF 4

A3

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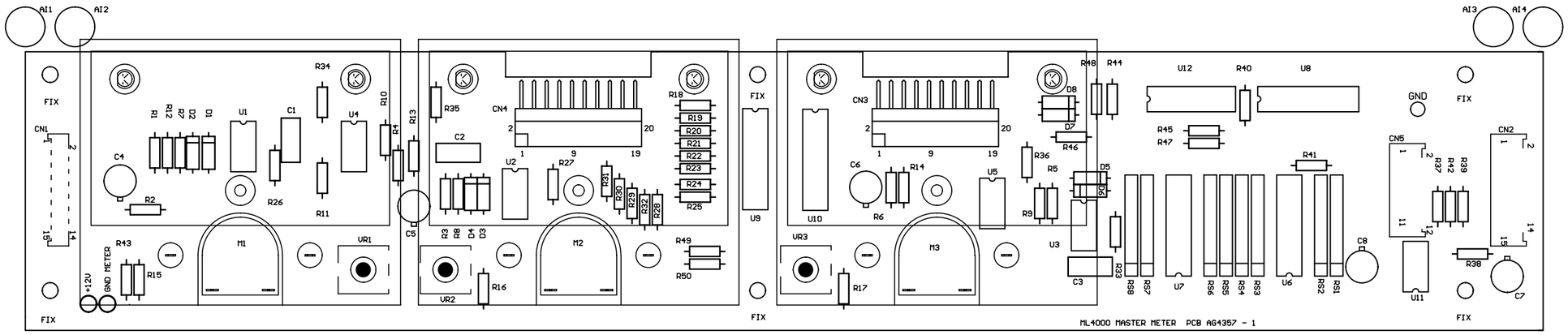
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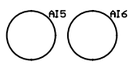
AI2
AI3
AI4
FIX
CN1
1
2
13
14
R1
R12
R7
D2
D1
U1
C1
R34
U4
R10
R4
R13
C4
R2
R26
R11
M1
R43
R15
+12V
GND METER
VR1
R35
CN4
C2
U2
R27
R18
R19
R20
R21
R22
R23
R24
R25
R31
R30
R29
R32
R28
R3
R8
D4
D3
C5
M2
R49
R50
VR2
R16
FIX
U9
CN3
U10
D8
D7
R46
R48
R44
R36
C6
R14
R6
U5
R5
D5
D6
R9
U3
VR3
M3
R17
C3
R33
R58
R57
U12
R40
U8
R45
R47
U7
R56
R55
R54
R53
R41
U6
R52
R51
C8
GND
CN5
R37
R42
R39
CN2
R38
U11
C7
ML4000 MASTER METER PCB AG4357 - 1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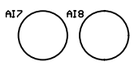
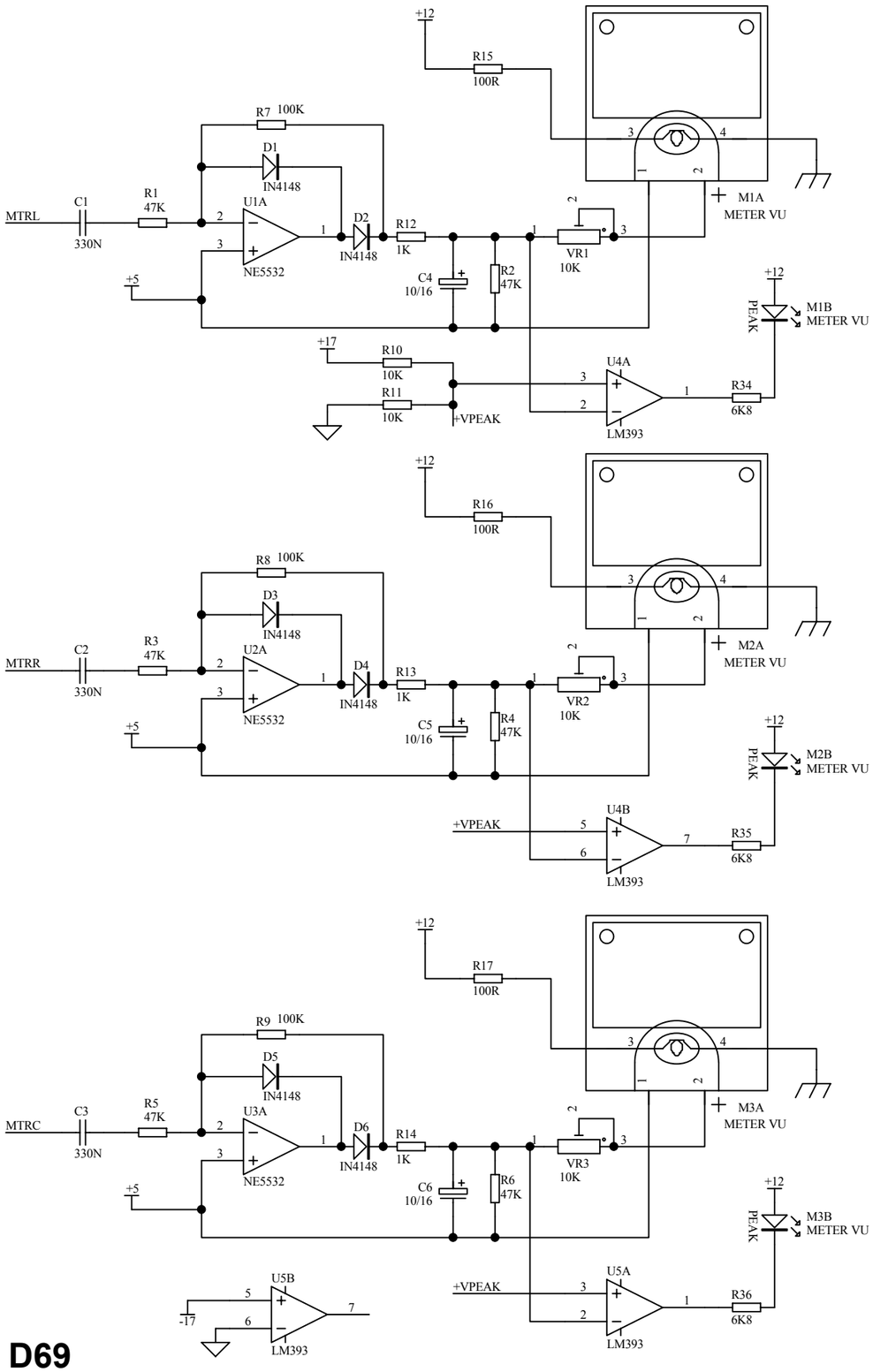
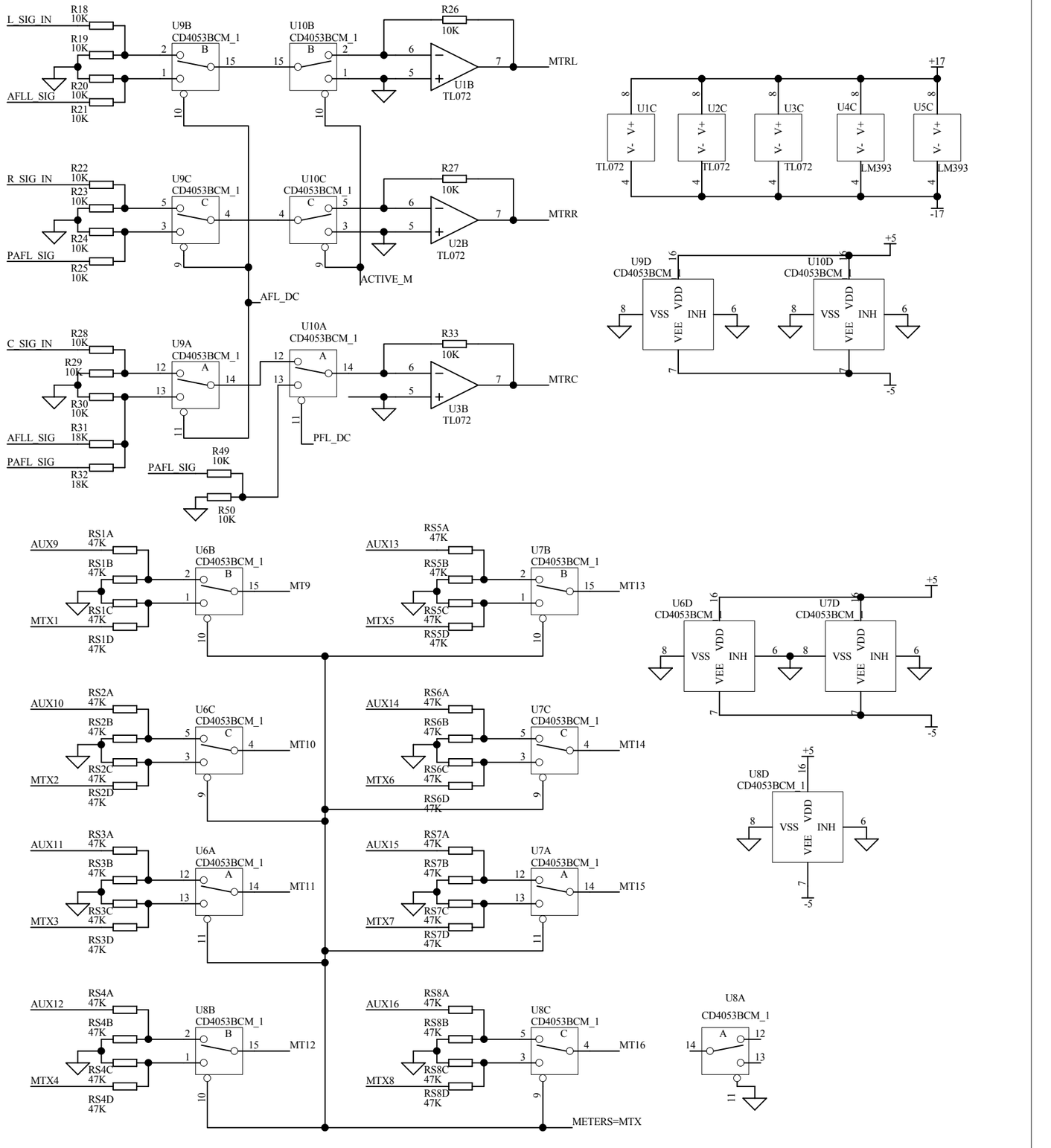
AI6


AI7
AI8





D69

ISSUE	BY	DATE
A	JB	12/01/01
1	JB	06/02/01

ORIGIN
SIL RESISTOR BLOCK MOVED, PADS ADDED, VALUE CHANGES.

TITLE: ML MASTER METER PCB

PAGE:

FILE: C4357P2_1.Sch | PRINTED:19:02:59 6-Dec-2002 | DRG No: 4357 | ISSUE: 1 | SHEET: 1 OF 2 | A3

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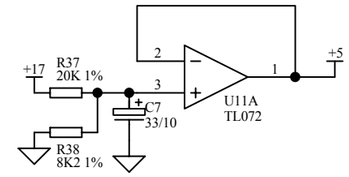

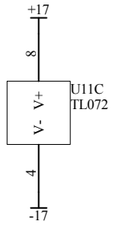

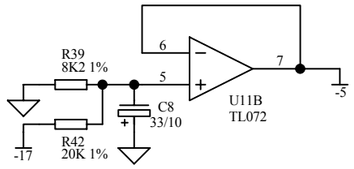

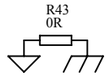

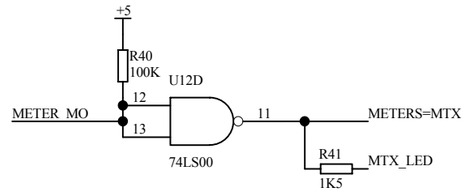

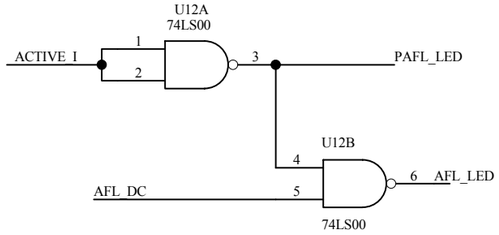

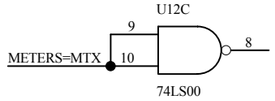

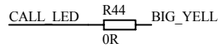

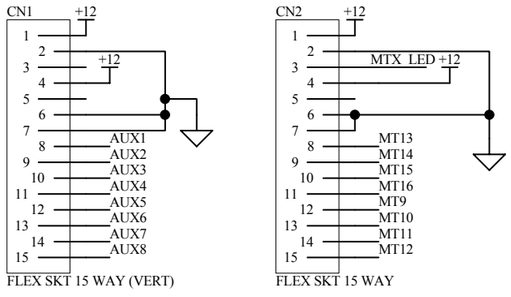

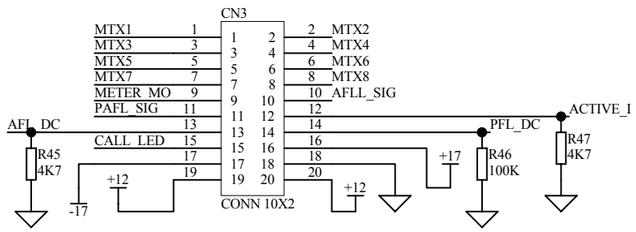

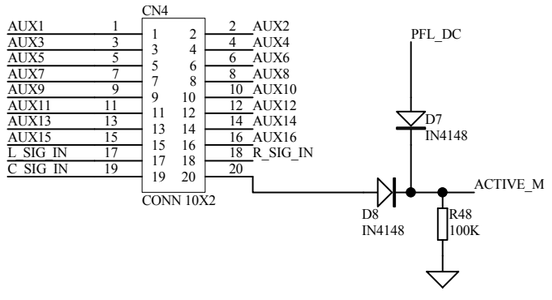

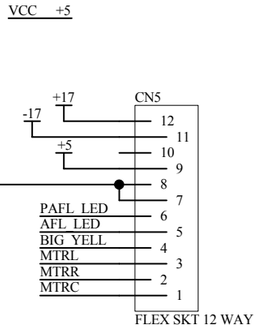

D70

ISSUE	BY	DATE						
A	JB	12/01/01	ORIGIN	TITLE: ML MASTER METER PCB				
1	JB	06/02/01	SIL RESISTOR BLOCK MOVED, PADS ADDED, VALUE CHANGES.	PAGE:				
			FILE: C4357P3_1.Sch	PRINTED:19:03:51 6-Dec-2002	DRG No: 4357	ISSUE: 1	SHEET: 2 OF 2	A3

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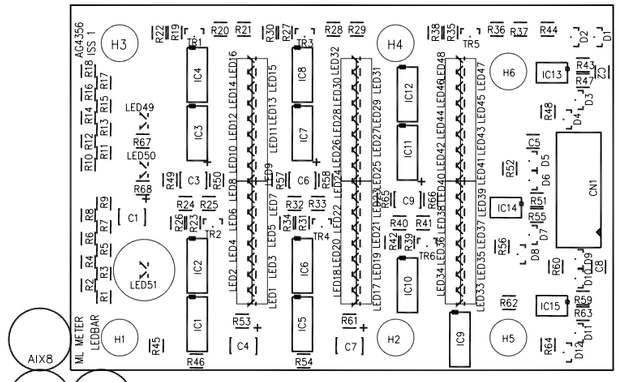
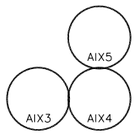
AIX7

ALLEN & HEATH ML METER LEDBAR PCB AG4356_1

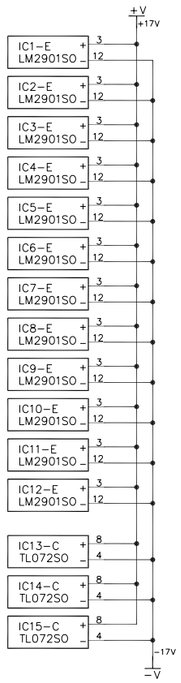
AIX6

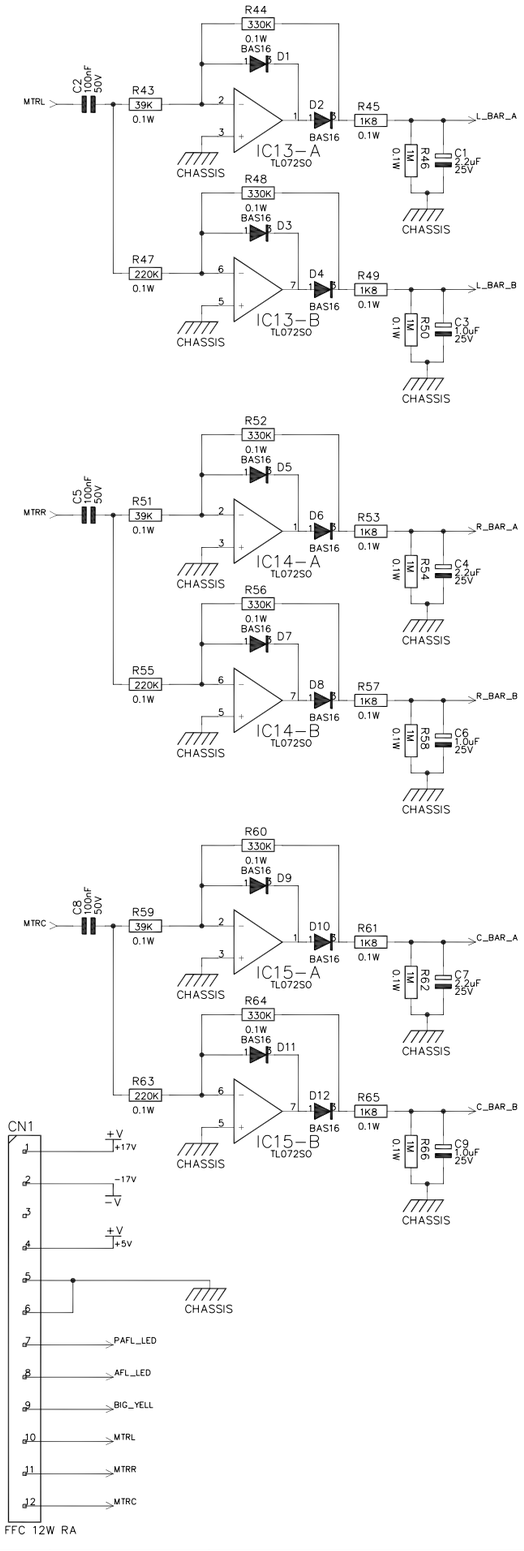


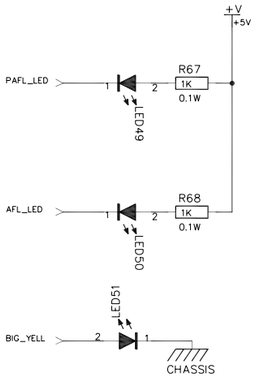


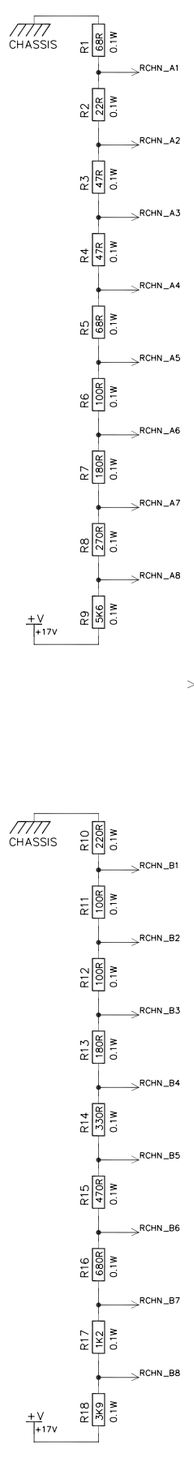
AG4356 ISS 1 TOP SILK BY AAT 08-02-01

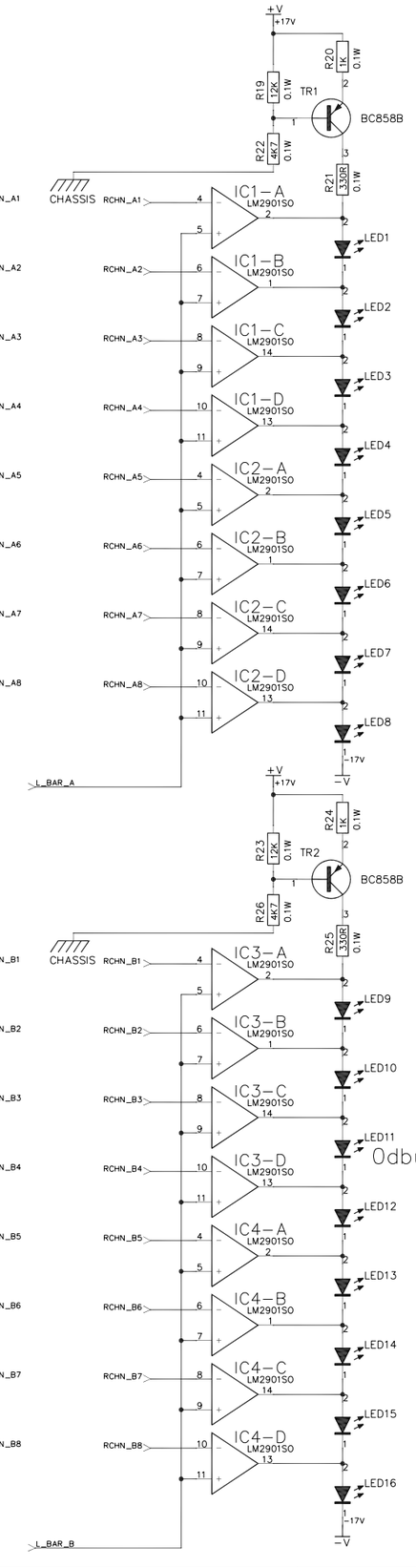
D71

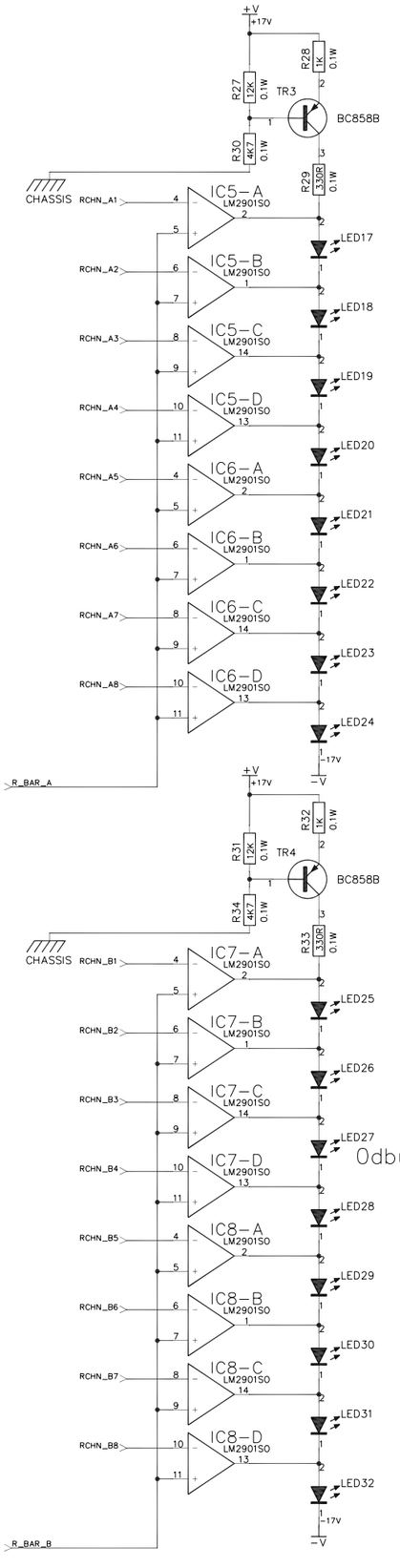


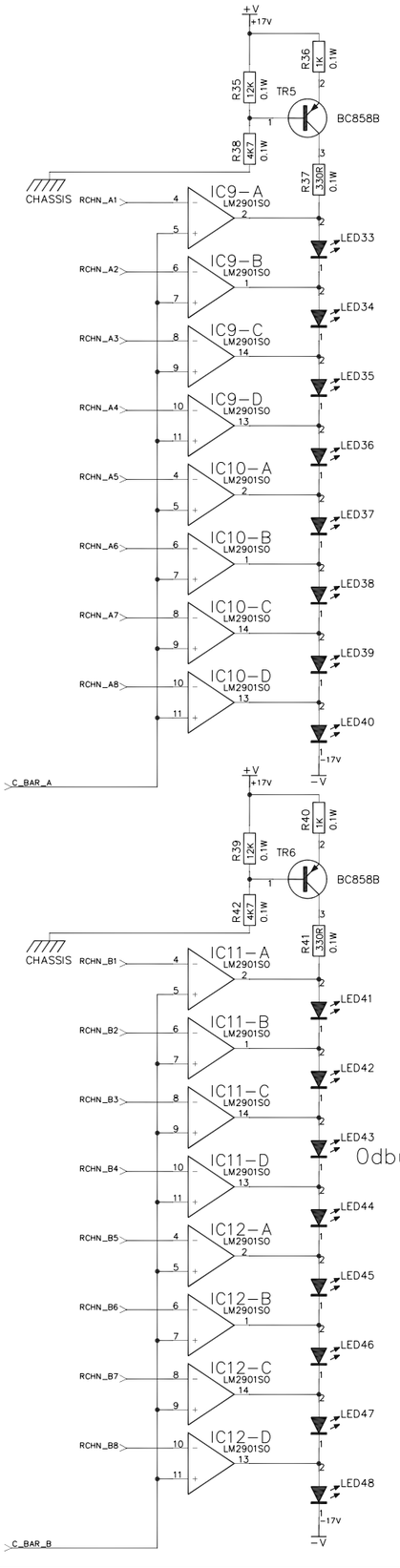












ISS	REVISION	BY DATE
A	ORIGIN	AAT 03-01-01
1	PRODUCTION	AAT 08-02-01

NOTES
1. RESISTORS MARKED * ARE 1%
   ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED
2. ELECTROLYTIC CAPACITORS ARE uF/VOLTS
3.

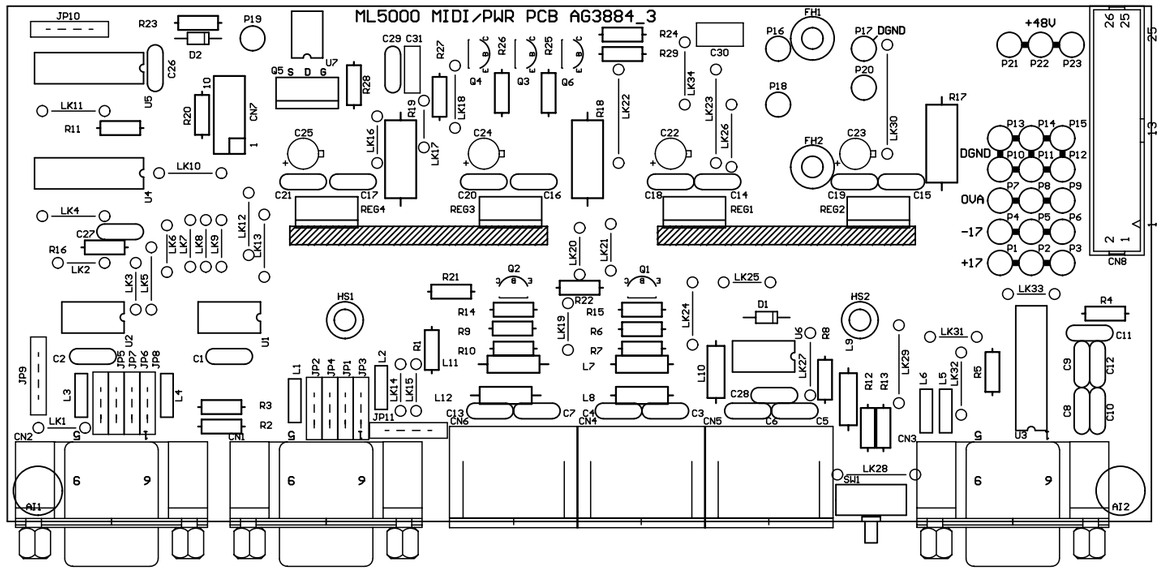
UNIT TITLE: ML METERS

DRAWING TITLE: ML METER LED BARS

CIRCUIT DIAGRAM PCB AG4356

ALLEN & HEATH **D72**
PENRYN, CORNWALL
ENGLAND, TR10 9LU

DRAWING No C4356 SHT 1 OF 1 ISSUE 1 A1



.GTO

D73

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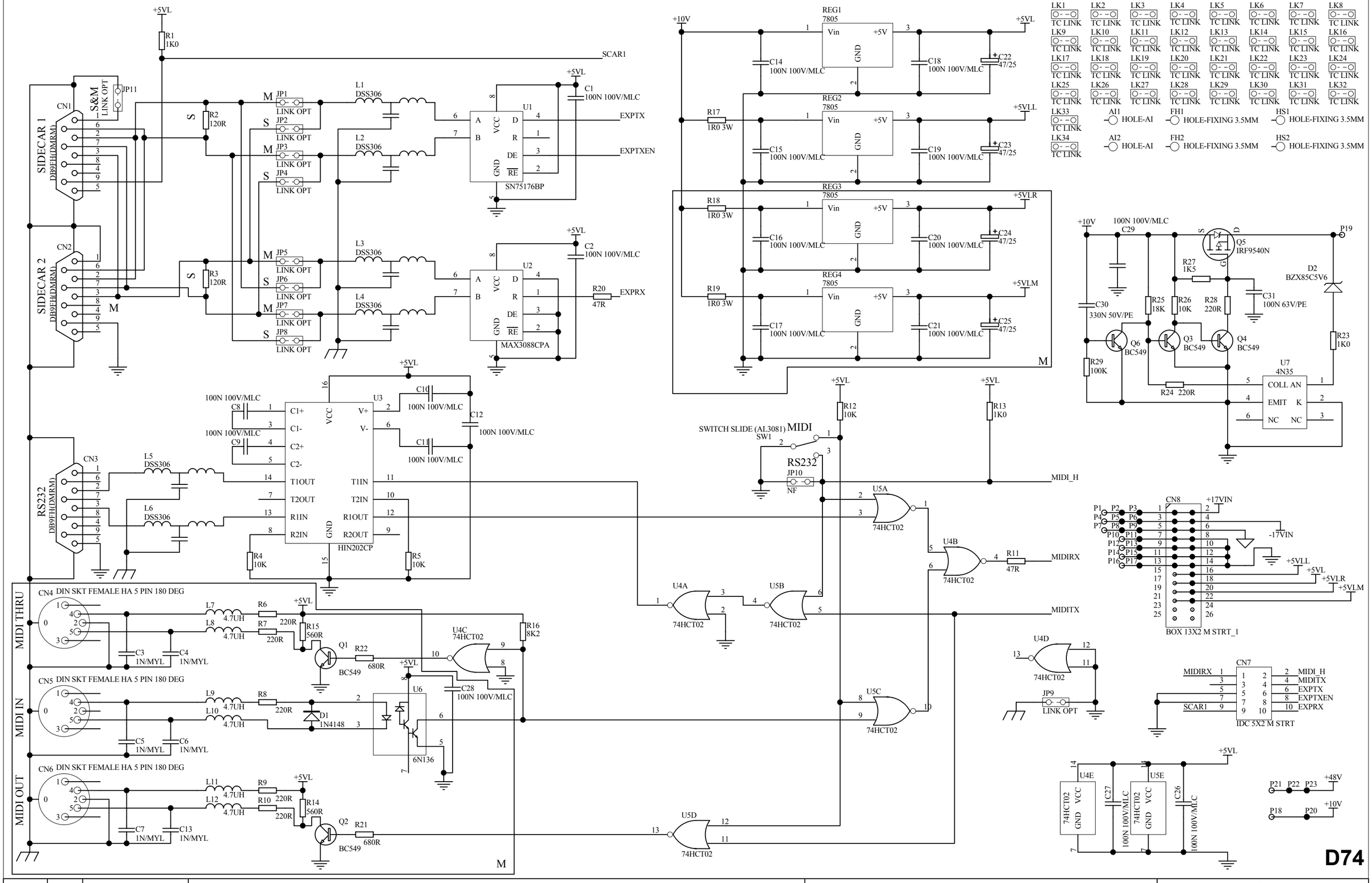
FILE: AG3884_3.PCB | PRINTED: 17:09:36 6-Dec-2002

TITLE: ML5000 MIDI POWER PCB

DRG No: AG3884 ISSUE: 3



ISSUE	BY	DATE
2	AAT	24-05-01
2.1	AAT	30-10-01
3	JB	21-05-02

ISSUE 2 CONVERSION TO PROTEL AND ADDITION OF 10V PROTECTION
ISSUE 2.1 U2 CORRECTED TO MAX3088CPA
ISSUE 3 CHANGES TO LITTLE LITE TRIP CIRCUIT

TITLE: ML5000 MIDI POWER PCB

PAGE:

FILE: C3884_3.Sch | PRINTED:17:11:07 6-Dec-2002 | DRG No: C3884 | ISSUE: 3 | SHEET: 1 OF 1 | A3

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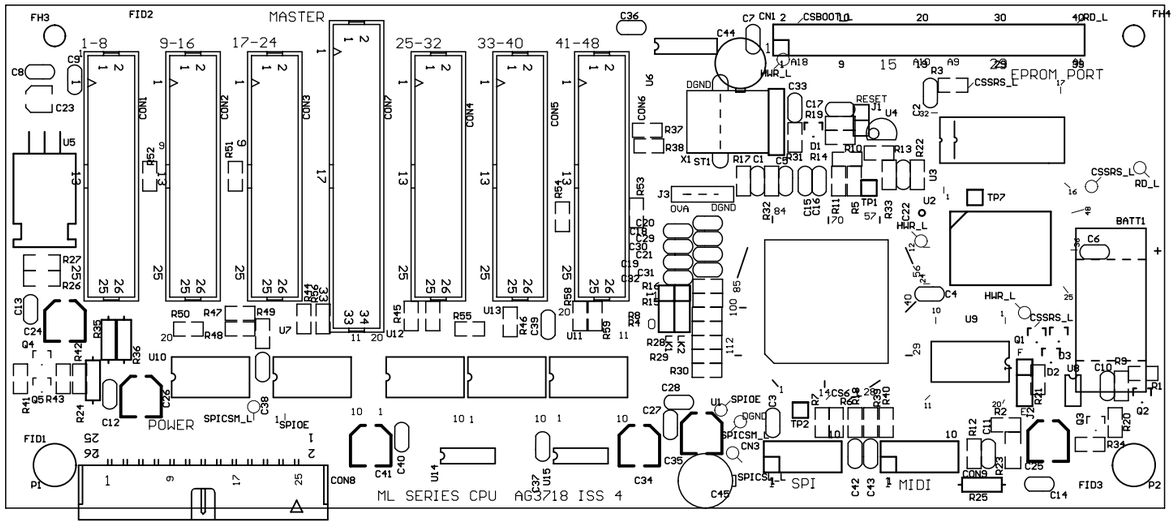

D75

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TOP OVERLAY .GTO

FILE: AG3718_4.PCB

PRINTED: 11:54:19 3-Dec-2002

TITLE: ML SERIES CPU PCB

DRG No: AG3718 ISSUE: 4

CPU

SRAM

FLASH

PROMICE CONNECTOR

REGULATOR

DAC

U1 H8/3003

U2 HY29F400BT-70

U3 TC551001CF-70L OR 32KX8 SRAM

U4 DS1233

U5A 7805

U5B 7805

U6 74HC138

U8A TL072D SMD

U8B TL072D SMD

U8C TL072D SMD

U9 TLV5639CDW

CN1 IDC 20X2 M STRT

LK1 SIL 3 M STRT

LK2 SIL 3 M STRT

J1 JUMP 2 STRT

J2 SIL 3 M STRT

ST1 CRYSTAL STRAP

D1 NF

Q1 BSS138

Q2 FDV304P

Q3 BC848B

Q4 BC858B

Q5 BC848B

BATT1 BAT 2.4V 150MAH

X1 14 MHz

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ISSUE	BY	DATE
ISS 3	AAT	07-12-00
ISS 3.1	AAT	26-01-01
ISS 3.2	AAT	26-10-01
ISS 4	AAT	20-11-01

FILE: AG3718_4P2.SCH

PRINTED: 12:00:53 3-Dec-2002

TITLE: ML3/4/5000 CPU PCB

PAGE: CPU & MEMORY

DRG No: AG3718 ISSUE: 4 SHEET: 2 OF 4

D76

SPIOE
SPICSL_L
SPICSM_L
SPICSR_L
SPICLK
VFBA2
VFBA1
VFBA0

U14F 74HC04
U14E 74HC04
U14D 74HC04
U15A 74HC08
U15B 74HC08
U15C 74HC08

+5VL
DGND

U7 74HC541
SPIOEL
SPISTBL
SPILDL_L
SPICLKL3
VFBA2L
VFBA1L
VFBA0L
SPICLKL2
R44 10R 0805
R56 10R 0805

U12 74HC541
SPIOEM
SPISTBM
SPILDM_L
SPICLKM
VFBA2M
VFBA1M
VFBA0M
SPICLKL1
R45 10R 0805
R57 10R 0805

U13 74HC541
SPIOER
SPISTBR
SPILDR_L
SPICLKR1
VFBA2R
VFBA1R
VFBA0R
R46 10R 0805

C38 100N_S

U14G 74HC04
U15E 74HC08
C37 100N_S

U14A 74HC04
U14B 74HC04
U14C 74HC04
U15D 74HC08

10K 1% 0805 R47
10K 1% 0805 R48
10K 1% 0805 R49
10K 1% 0805 R50
10K 1% 0805 R51
10K 1% 0805 R52
C39 100N_S

U10 74HC244
SPIMISOL1
SPIMISOL2
SPIMISOL3
SPIMISOM3
SPIMISOM2
SPIMISOM1
SPIMISO1
SPIMISO2
SPIMISO3
10K 1% 0805 R28
10K 1% 0805 R29
10K 1% 0805 R30

U11 74HC244
SPIMISOR1
SPIMISOR2
SPIMISOR3
10K 1% 0805 R53
10K 1% 0805 R54
10K 1% 0805 R55
R58 10R 0805
R59 10R 0805
SPICLKR2
SPICLKR3

SPI BUFFERING

SPI GATING

D77

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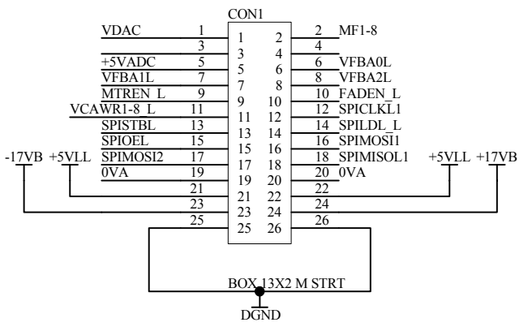
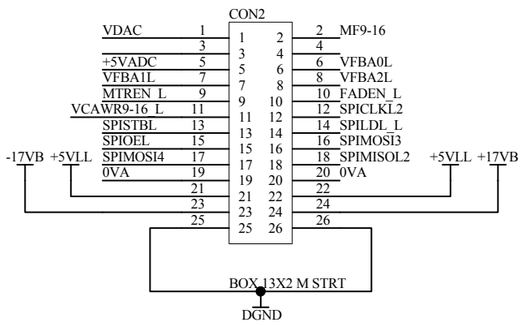
FILE: AG3718_4P3.SCH
PRINTED: 12:00:53 3-Dec-2002

TITLE: ML3/4/5000 CPU PCB
PAGE: SPI &BUFFERING
DRG No: AG3718 ISSUE: 4 SHEET: 3 OF 4

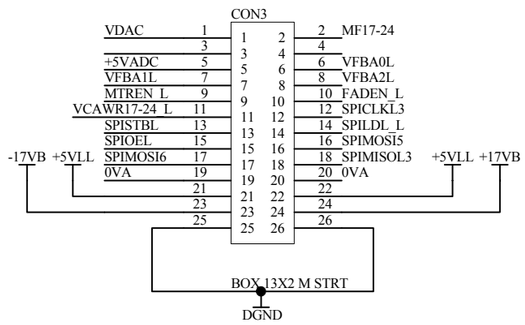
L1-8 CONNECTOR

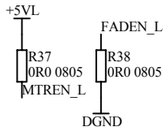


L9-16 CONNECTOR

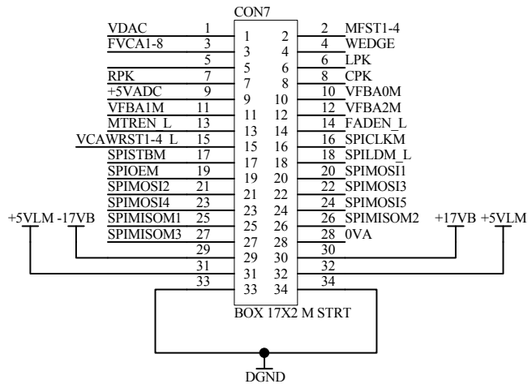


L17-24 CONNECTOR

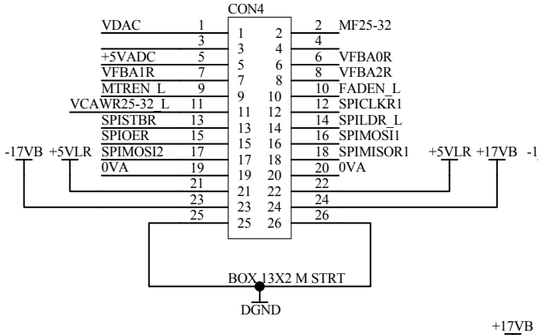




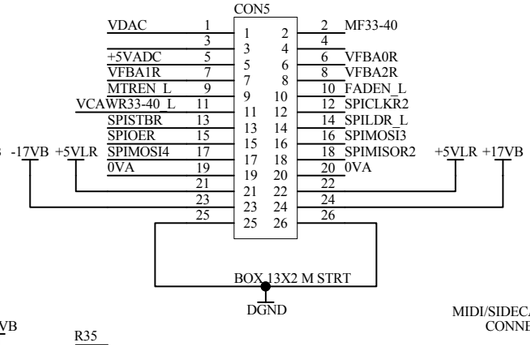
MASTER CONNECTOR



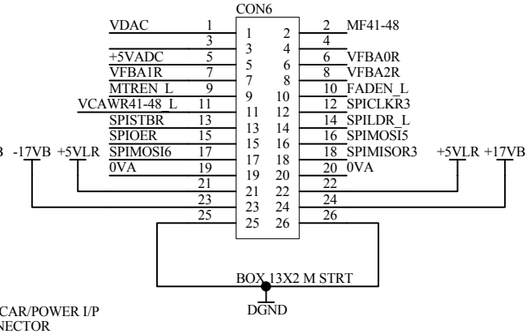
R25-32 CONNECTOR



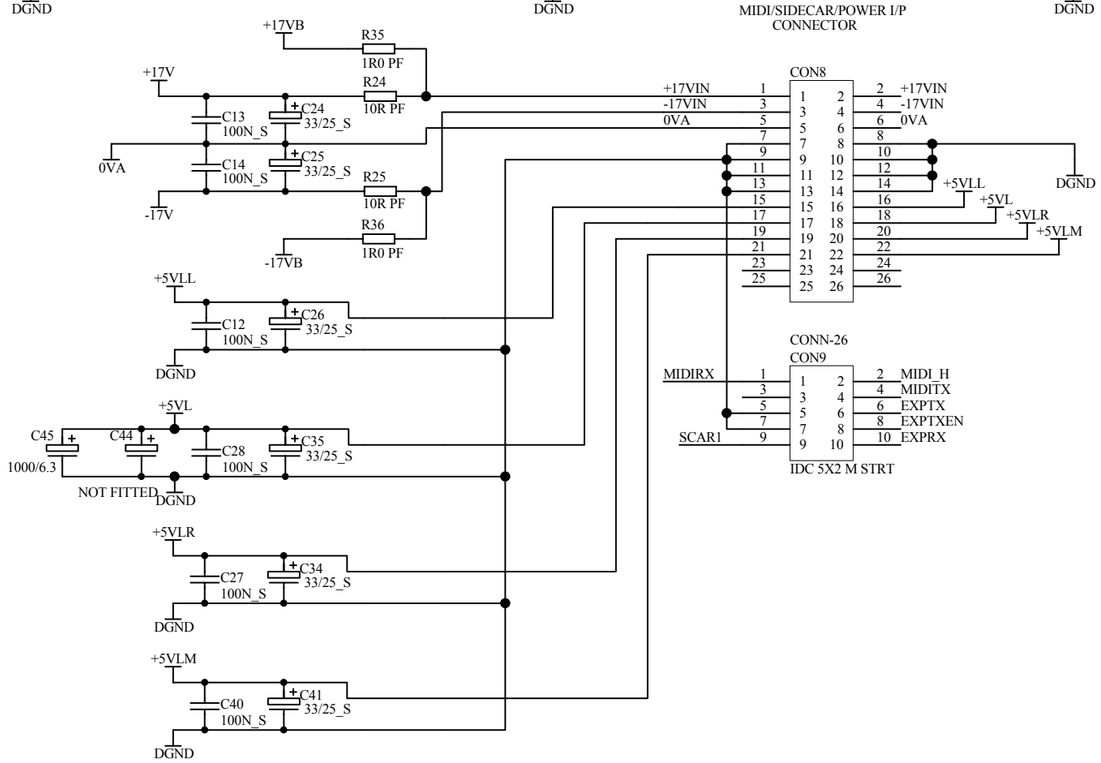
R33-40 CONNECTOR



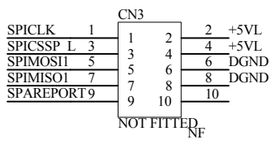
R41-48 CONNECTOR



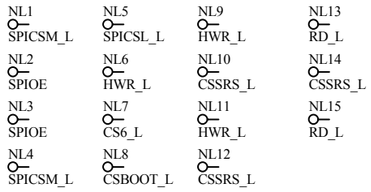
MIDI/SIDECAR/POWER I/P CONNECTOR

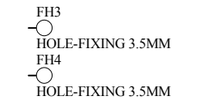


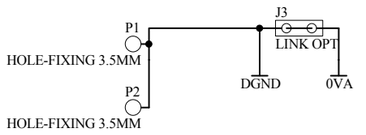
SPI EXPANSION CONNECTOR



ARRANGE SIGS FOR EASY TRACKING







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ISSUE	BY	DATE
ISS 3	AAT	07-12-00
ISS 3.1	AAT	26-01-01
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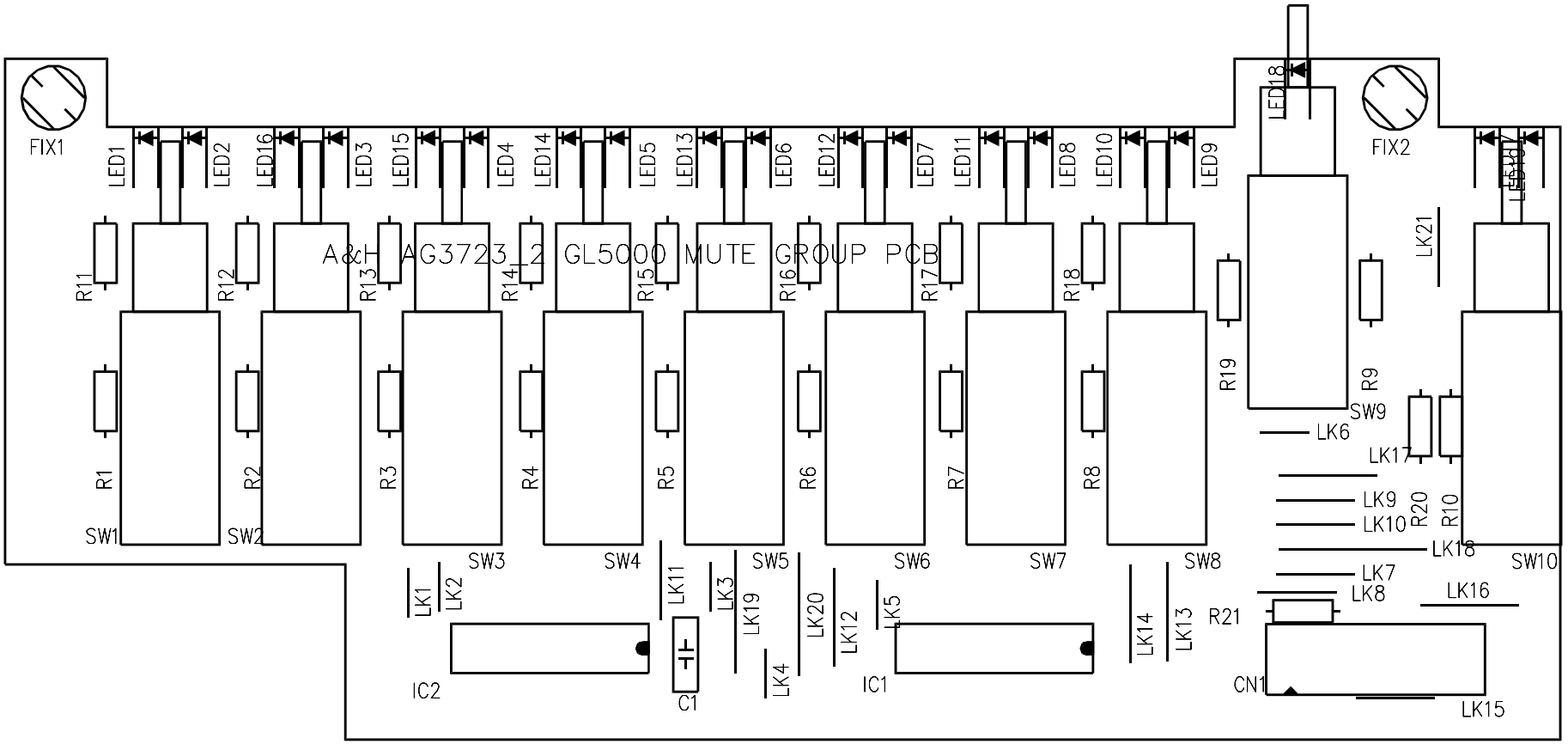
ISS 4	AAT	20-11-01

FILE: AG3718_4P4.SCH | PRINTED: 12:00:54 3-Dec-2002

TITLE: ML3/4/5000 CPU PCB
PAGE: CONNECTORS
DRG No: AG3718 ISSUE: 4 SHEET: 4 OF 4


A&T AG3723_L2 GL5000 MUTE GROUP PCB
FIX1
FIX2
LED1
LED2
LED16
LED3
LED15
LED4
LED14
LED5
LED13
LED6
LED12
LED7
LED11
LED8
LED10
LED9
LED18
LED17
LED19
R11
R12
R13
R14
R15
R16
R17
R18
R19
R9
LK21
R1
R2
R3
R4
R5
R6
R7
R8
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
SW10
LK6
LK17
LK9
LK10
R20
R10
LK18
LK7
LK8
LK16
R21
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LK2
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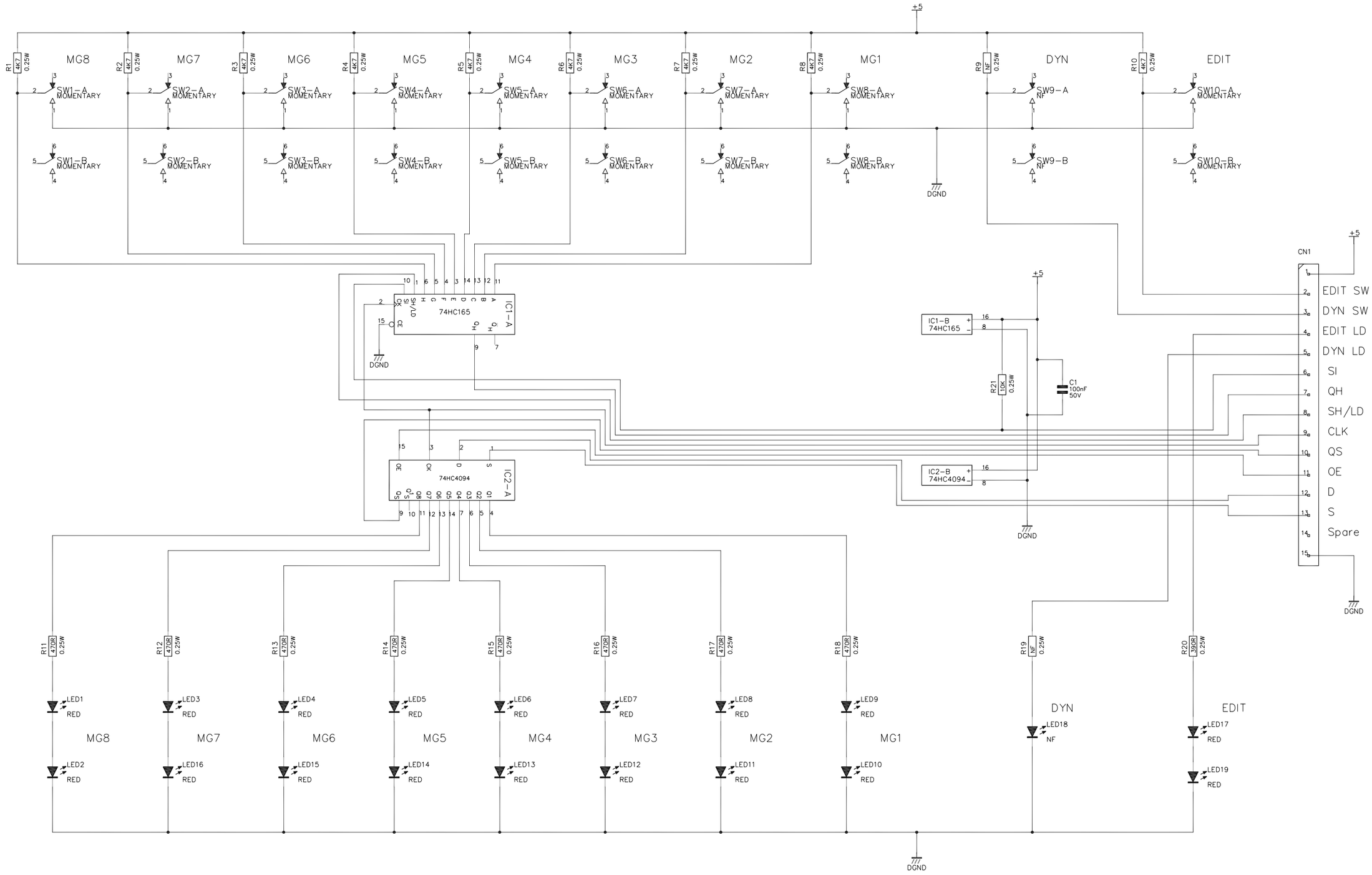
LK12
LK5
LK14
LK13
IC2
C1
LK4
IC1
CN1
LK15

D79



D80

ISS	REVISION	BY	DATE
A	ORIGIN	GMR	30/7/99
1	GROUND PLANE ADDED TO MOUNTINGS	AAT	02-12-99
2	VALUE CHANGES &(LED HEIGHT)	AAT	22-02-00

NOTES
1. RESISTORS MARKED * ARE 1%
   ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED
2. ELECTROLYTIC CAPACITORS ARE uF/VOLTS
3.

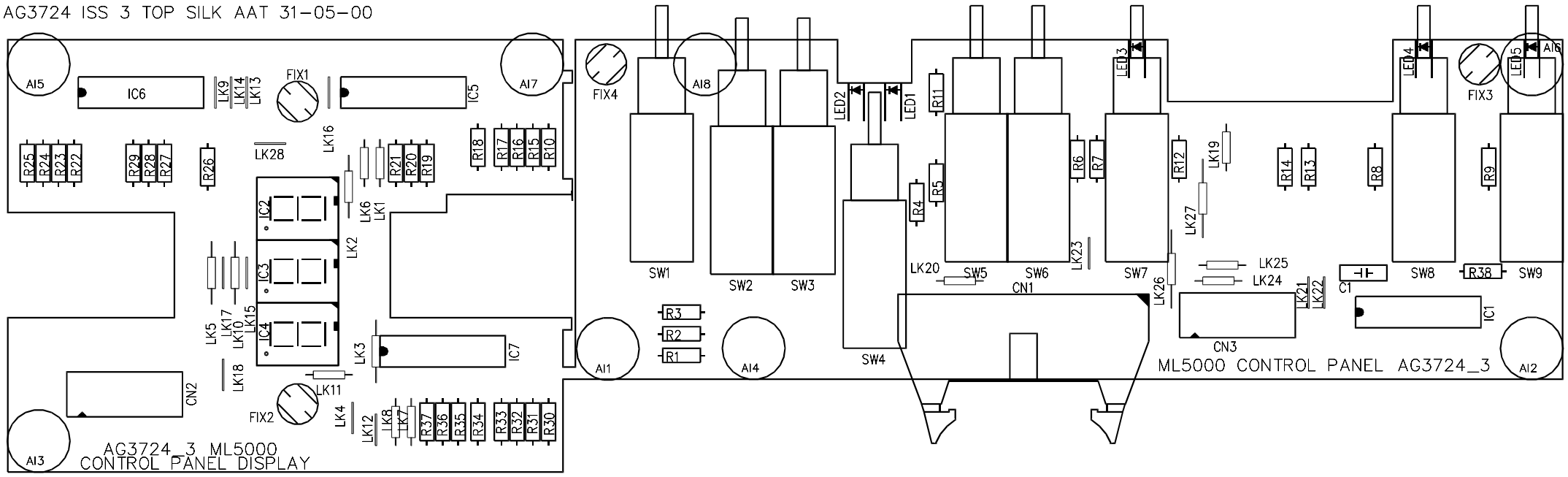
UNIT TITLE: ML5000

DRAWING TITLE: Mute Group Keyboard

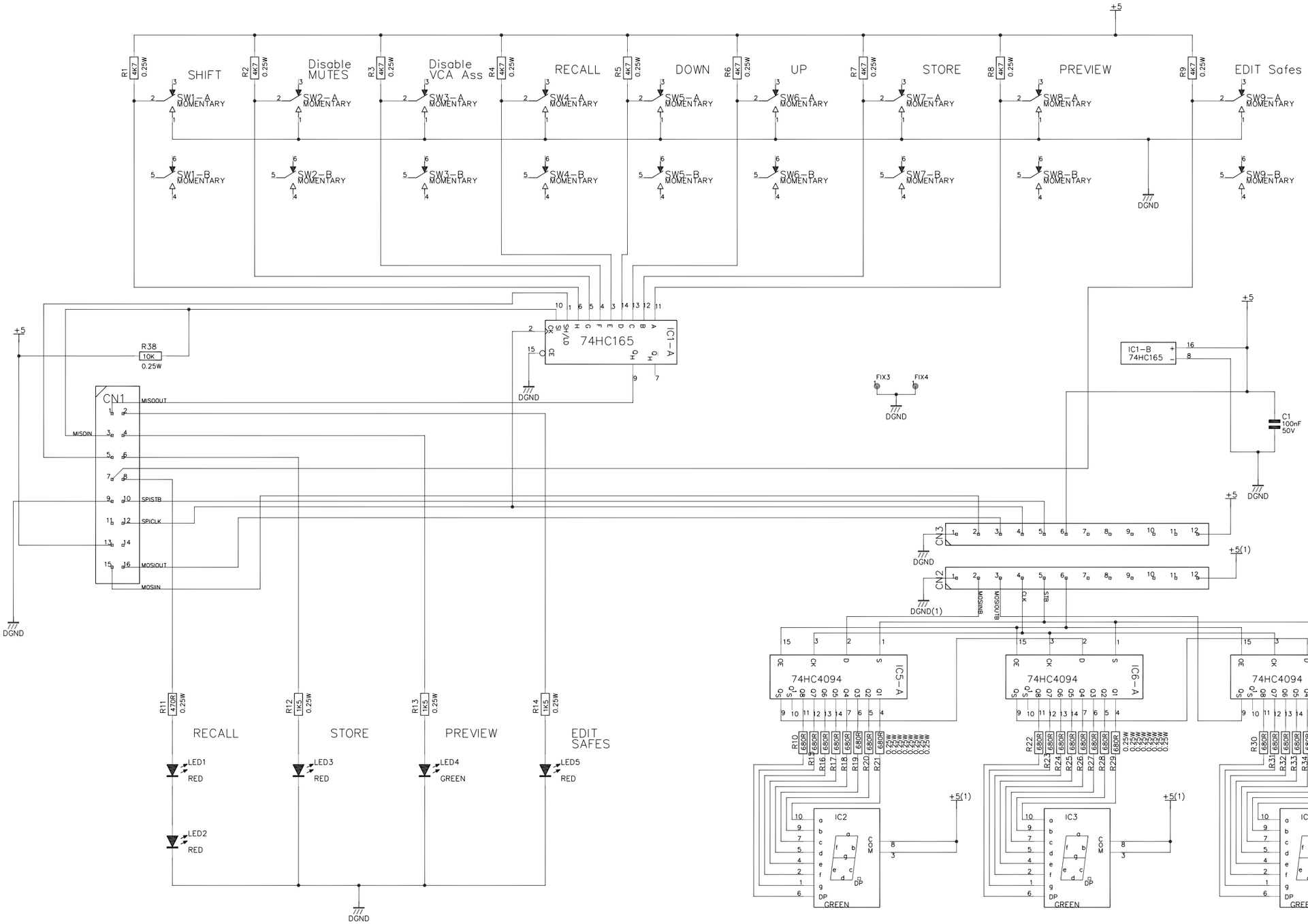
CIRCUIT DIAGRAM PCB AG 3723

ALLEN & HEATH
PENRYN, CORNWALL
ENGLAND, TR10 9LU

DRAWING No 3723 SHT 1 OF 1 ISSUE 2 A1


AG3724 ISS 3 TOP SILK AAT 31-05-00
AI5
IC6
LK9
LK14
LK13
FIX1
IC5
AI7
FIX4
AI8
LED2
LED1
R11
LED3
LED4
FIX3
LED5
AI6
R25
R24
R23
R22
R29
R28
R27
R26
LK28
LK16
R21
R20
R19
R18
R17
R16
R15
R10
IC2
IC3
IC4
LK6
LK1
LK2
R4
R5
R6
R7
LK20
SW5
SW6
LK23
SW7
R12
LK19
LK27
R14
R13
R8
R9
SW1
SW2
SW3
SW4
CN1
LK26
LK25
LK24
LK21
LK22
C1
SW8
R38
SW9
LK5
LK17
LK10
LK15
LK18
LK3
IC7
IC1
R3
R2
R1
AI1
AI4
CN2
LK11
FIX2
LK4
LK12
LK8
LK7
R37
R36
R35
R34
R33
R32
R31
R30
CN3
AI2
AI3
AG3724_3 ML5000
CONTROL PANEL DISPLAY
ML5000 CONTROL PANEL AG3724_3

D81



D82

ISS	REVISION	BY	DATE
A	ORIGIN	GMR	30/7/99
1	GROUND PLANE ADDED TO MOUNTINGS	AAT	02/12/99
2	VALUE CHANGE (LED HEIGHTS ON PCB	AAT	22/02/00
3	MODE SWITCH HEIGHT LIFTED 2mm	AAT	31/05/00

NOTES
1. RESISTORS MARKED * ARE 1%
   ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED
2. ELECTROLYTIC CAPACITORS ARE uF/VOLTS
3.

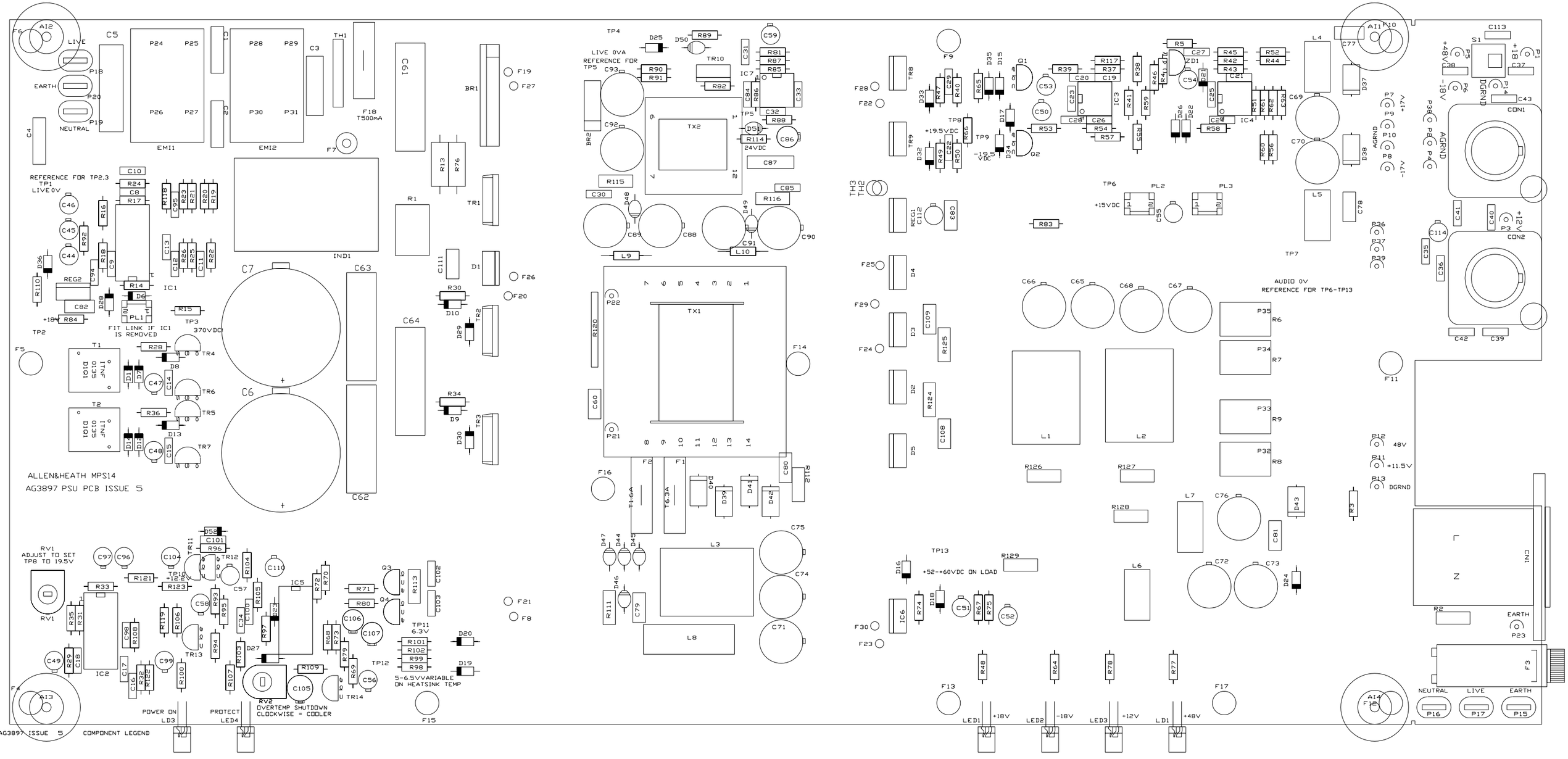
UNIT TITLE: ML5000

DRAWING TITLE: Control Panel

CIRCUIT DIAGRAM PCB AG 3724

ALLEN & HEATH
PENRYN, CORNWALL
ENGLAND, TR10 9LU

DRAWING No 3724 SHT 1 OF 1 ISSUE 3 A1


LIVE
EARTH
NEUTRAL
EMI1
EMI2
F18
T500mA
REFERENCE FOR TP2,3
TP1
LIVE 0V
FIT LINK IF IC1
IS REMOVED
370VDC
TP2
TP3
ALLEN&HEATH MPS14
AG3897 PSU PCB ISSUE 5
LIVE 0VA
REFERENCE FOR
TP5
TX2
24VDC
+19.5VDC
-19.5 VDC
TX1
T1.6A
T6.3A
AUDIO 0V
REFERENCE FOR TP6-TP13
+15VDC
+52-+60VDC ON LOAD
RV1
ADJUST TO SET
TP8 TO 19.5V
+12.5V
RV2
OVERTEMP SHUTDOWN
CLOCKWISE = COOLER
POWER ON
LED3
PROTECT
LED4
5-6.5VVARIABLE
ON HEATSINK TEMP
6.3V
AG3897 ISSUE 5
COMPONENT LEGEND
LED1
+18V
LED2
-18V
LED3
+12V
LD1
+48V
NEUTRAL
LIVE
EARTH
48V
+11.5V
DGRND
AGRND
+12V
-17V
+17V

D83

DANGER - HIGH VOLTAGE

DISCONNECT POWER BEFORE REMOVING PSU

REFER SERVICE WORK TO QUALIFIED SERVICE PERSONNEL ONLY

HALF BRIDGE SMPSU

370VDC

PFC

CURRENT LIMIT

POST REGULATOR

PRE-REGULATOR VOLTAGE SET

FAULT PROTECT

48V REGULATOR

AUX PSU

FAN AND OVER TEMP CCT

SHORT CCT DETECT

ON LOAD VOLTAGES
MEASURED ON PCB

D84

ISS.	REVISION	BY	DATE
1	PRODUCTION	ARJ	29-2-00
1A	VALUES	ARJ	25-4-00
1B	VALUE CHANGES PFC	ARJ	8-5-00
2	PCB UPDATES	ARJ	5-10-00
3	REVISION 3	ARJ	5-12-00
4	DC CONN EARTHING	AA7	16-06-01
5	RESISTOR R129 FROM 12K* TO 47K	DWD	20-03-03
5.1	ECN768	DWD	19-04-06
5.3	ECN788	DWD	12-09-02

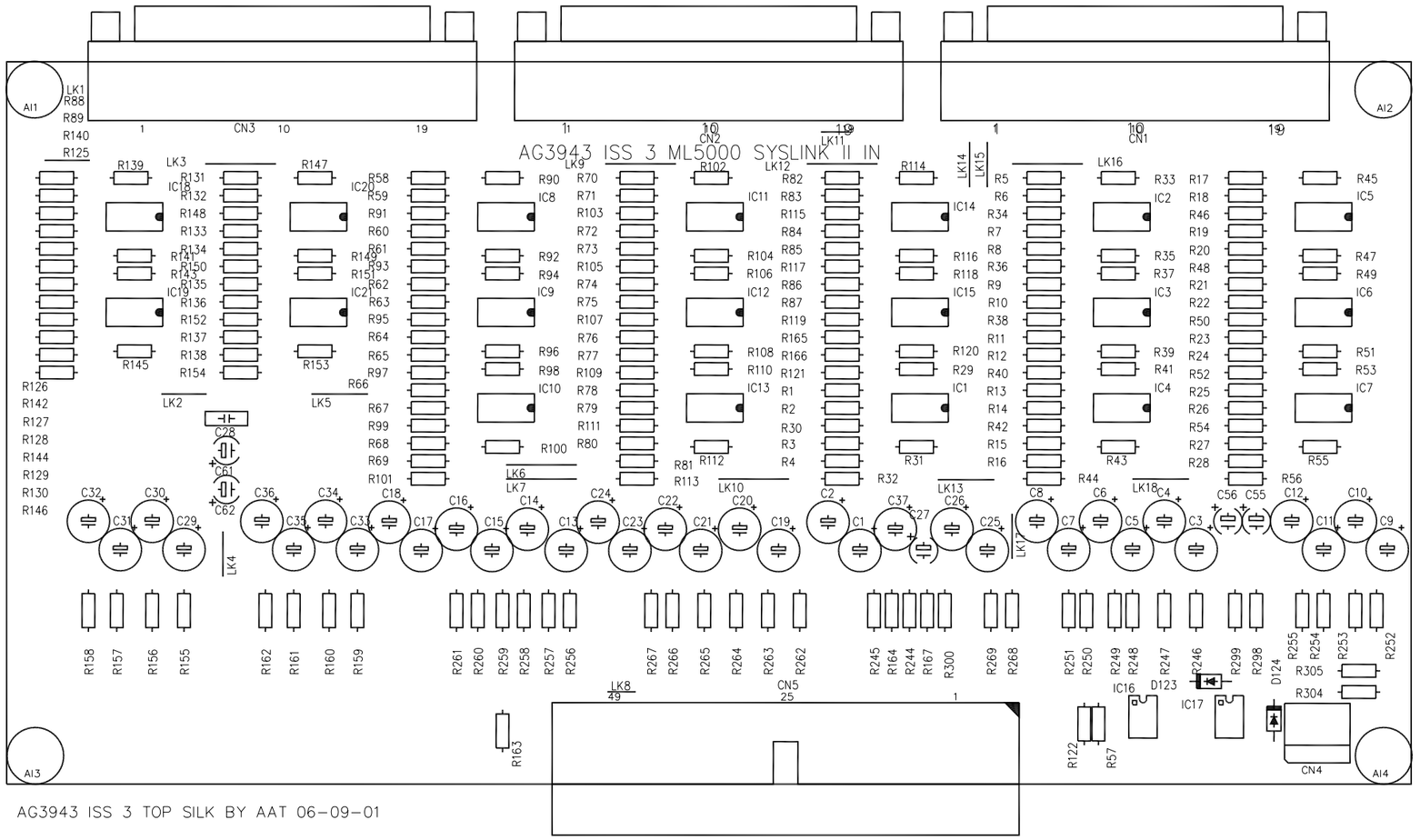
NOTES

1. RESISTORS MARKED * ARE 1%
   ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE MARKED
2. ELECTROLYTIC CAPACITORS ARE 'F'/VOLTS

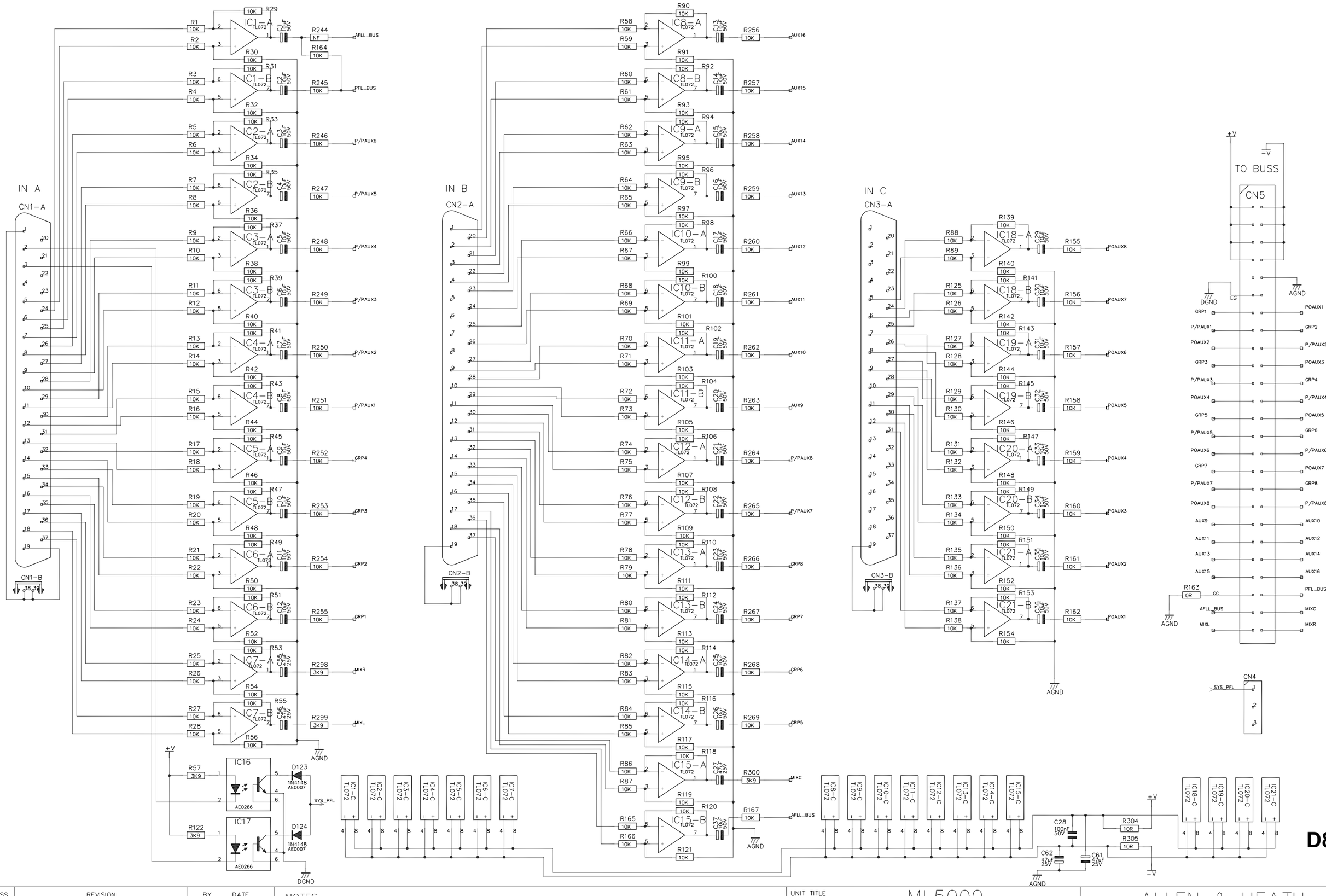
SERVICE PRECAUTION

WHEN SERVICING THE UNIT ALWAYS CONNECT AN ISOLATING TRANSFORMER OF SUITABLE POWER RATING BETWEEN THE POWER SUPPLY UNIT AND THE AC LINE SUPPLY TO REDUCE THE RISK OF ELECTRIC SHOCK

UNIT TITLE	MPS14
DRAWING TITLE	PSU SCHEMATIC
	PCB AG3897
MANUFACTURED IN ENGLAND BY	ALLEN & HEATH
DRAWING No.	C3897
ISSUE	5.3
	A1


AG3943 ISS 3 ML5000 SYSLINK II IN
AI1
AI2
AI3
AI4
CN1
CN2
CN3
CN4
CN5
LK1
LK2
LK3
LK4
LK5
LK6
LK7
LK8
LK9
LK10
LK11
LK12
LK13
LK14
LK15
LK16
LK17
LK18
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC10
IC11
IC12
IC13
IC14
IC15
IC16
IC17
IC18
IC19
IC20
IC21
D123
D124
AG3943 ISS 3 TOP SILK BY AAT 06-09-01

D85



D86

ISS	REVISION	BY	DATE
A	ORIGIN	GMR	8/11/99
1	AAT/PFL CHANGES	GMR	8/03/00
2	GROUND PLANE CLEARANCE	AAT	28/06/00
3		AAT	07-09-01

NOTES
1. RESISTORS MARKED * ARE 1%
   ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED
2. ELECTROLYTIC CAPACITORS ARE uF/VOLTS
3.

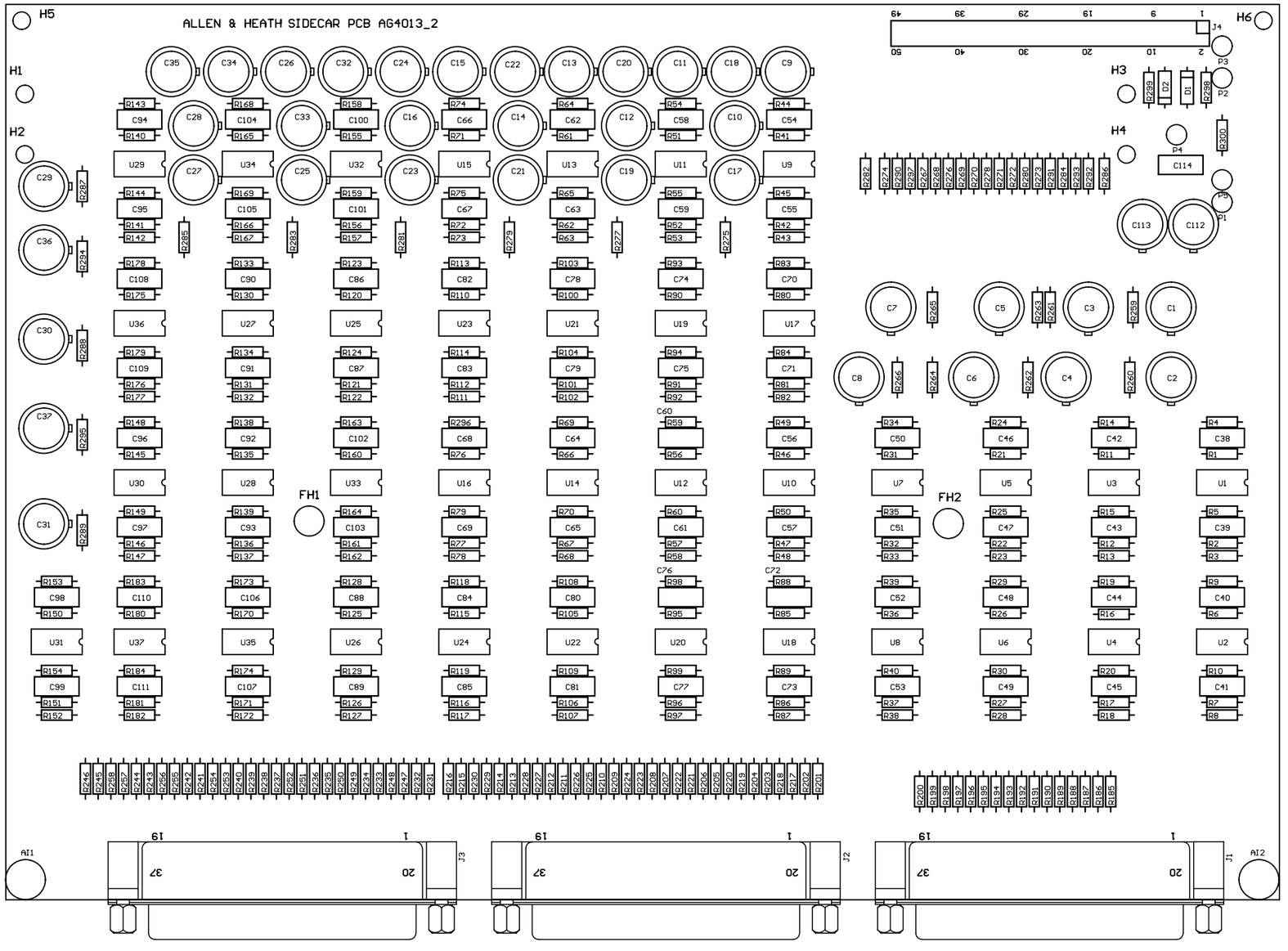
UNIT TITLE: ML5000

DRAWING TITLE: CIRCUIT DIAGRAM
SYSLINK 2 IN PCB
PCB AG 3943

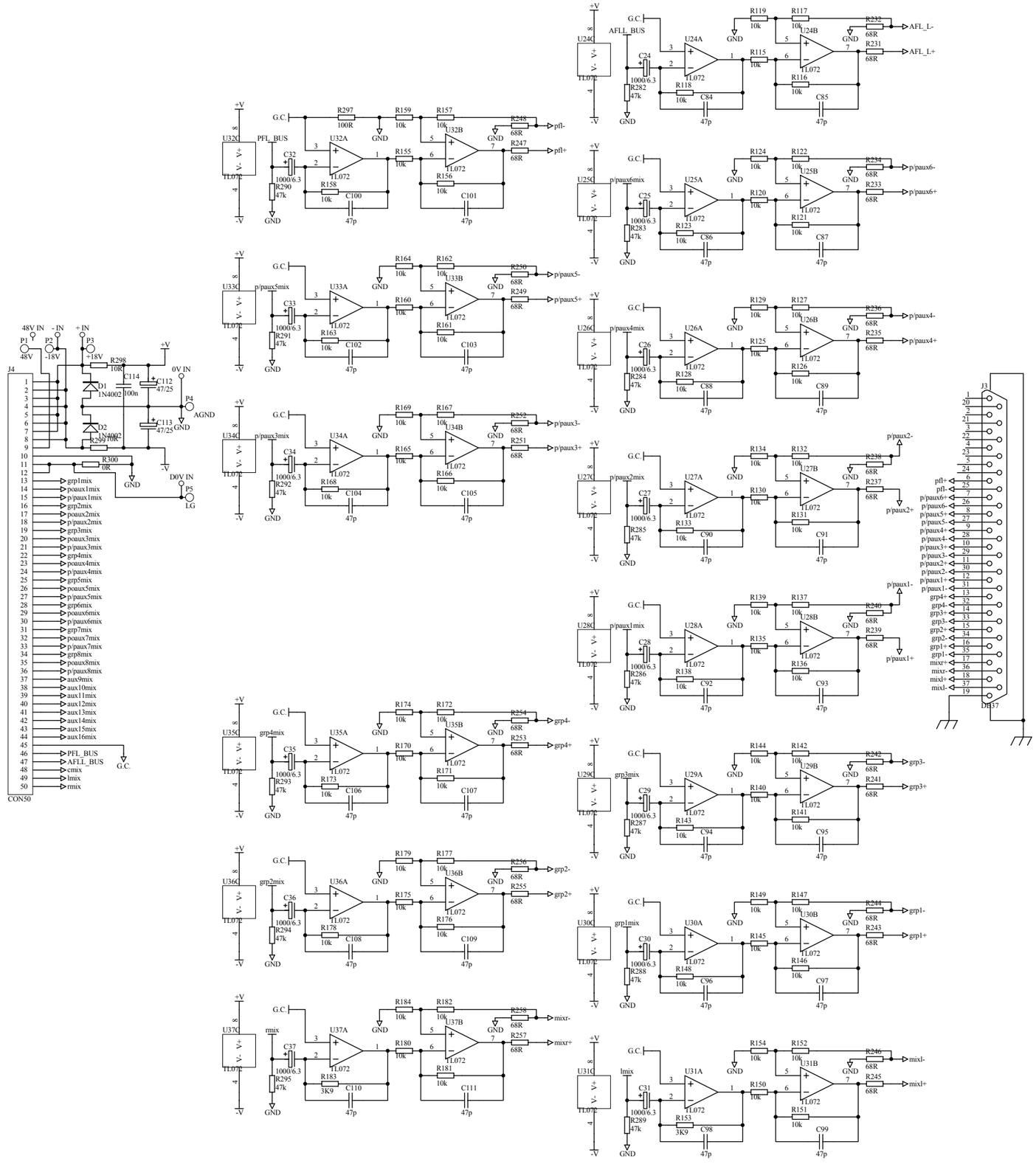
ALLEN & HEATH
PENRYN, CORNWALL
ENGLAND, TR10 9LU

DRAWING No C 3943 SHT 1 OF 1 ISSUE 3 A1

05-07-00 AAT TOP OVERLAY ISS 2 4013_2TO



D87



D88

ISSUE	BY	DATE
A	GMR	
1	AAT	06-06-00
2.1	AAT	05-09-00

TITLE: ML5000 SYSLINK II OUT

PAGE:

FILE: G:\Product Directories\ML5000\PCB\ML5KSYSLINK II OUT4013_2.1\SYSLINKOUT.ddb - Documents\AG4013 ISSUE 2.1\C4013_2.1.sch

DISK:

NO.: C4013 | ISSUE: 2.1 | SHEET 1 OF 2 | A3

Allen & Heath
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Penryn, Cornwall,
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TR10 9LU
Tel: (44) (0) 1326 372070
Fax: (44) (0) 1326 365736

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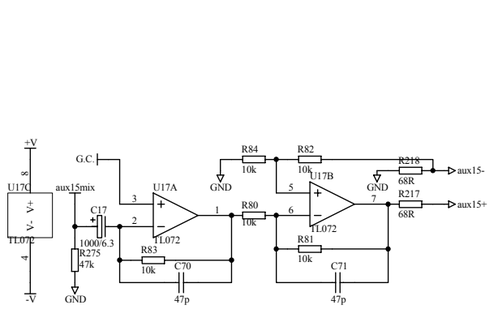

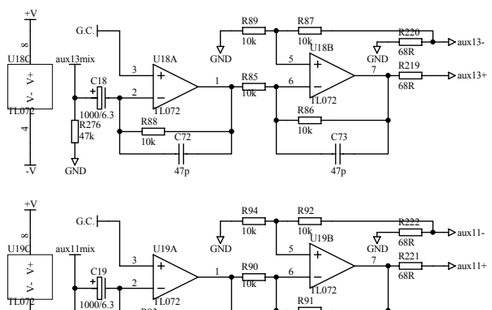

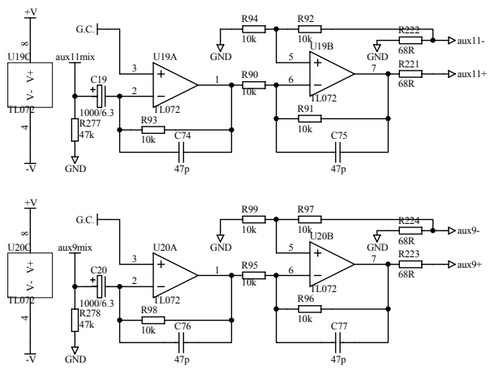

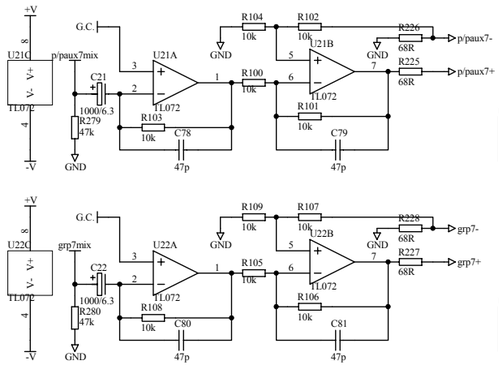

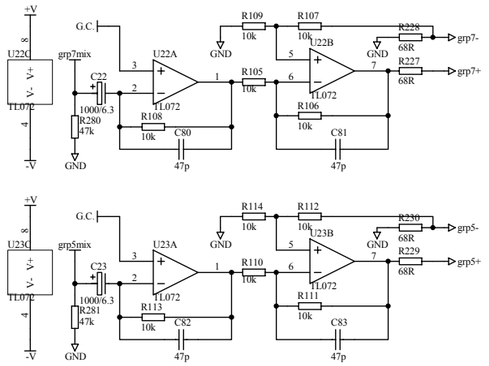

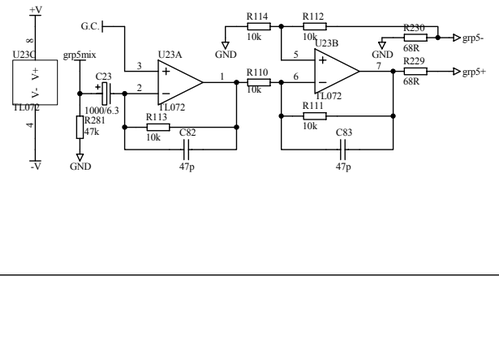

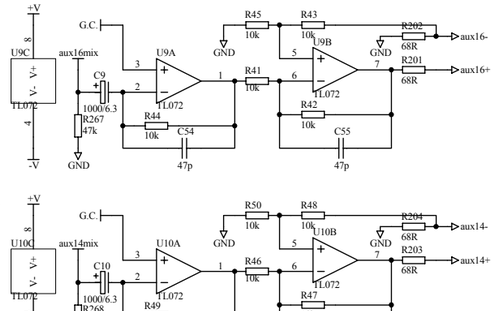

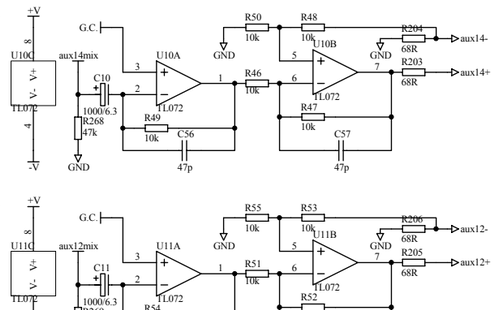

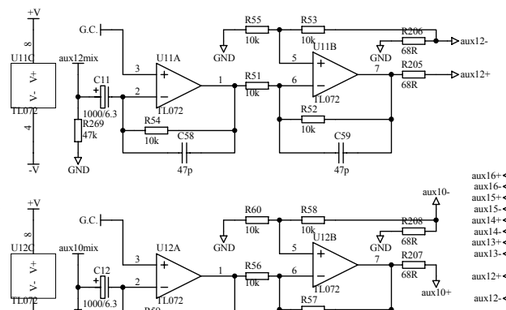

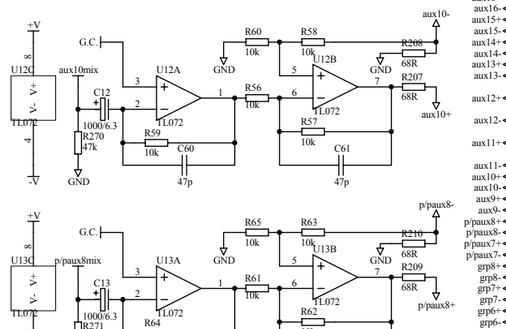

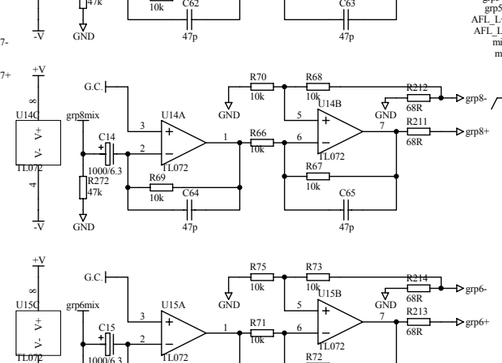

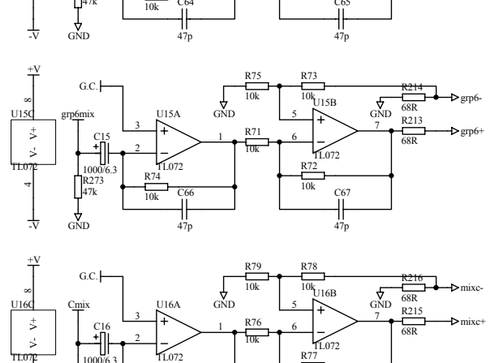

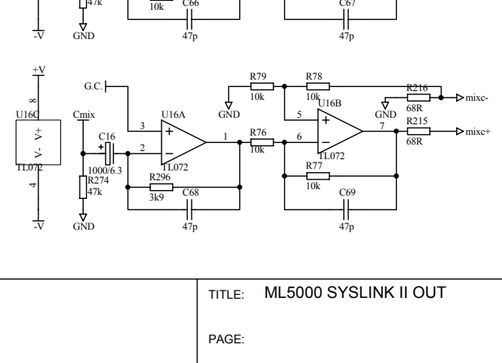

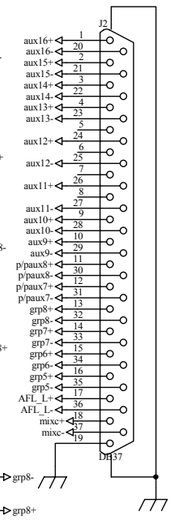

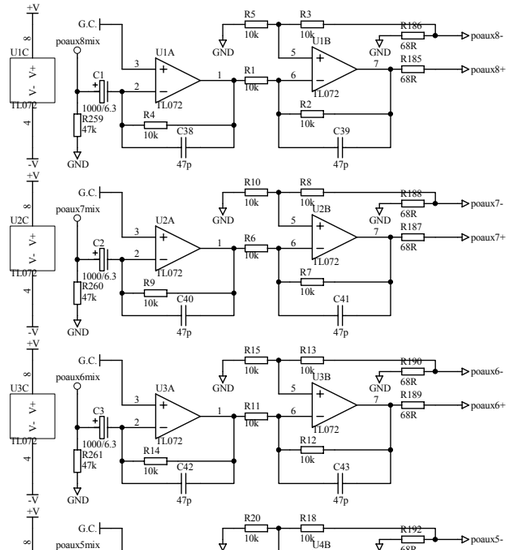

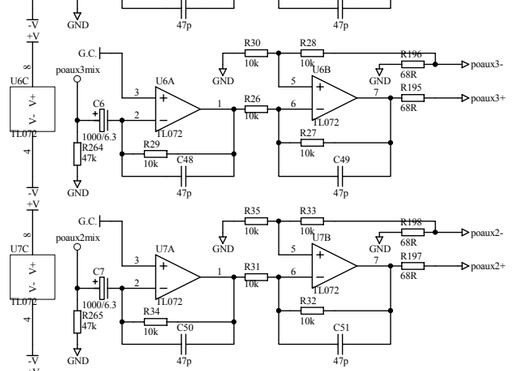

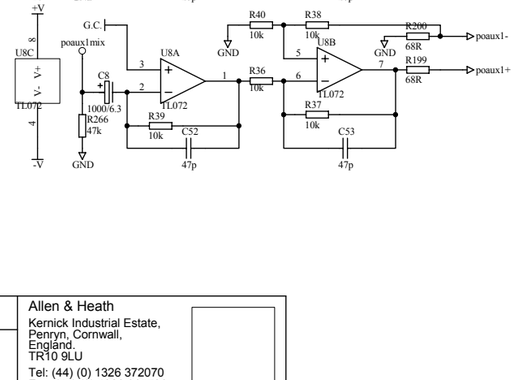

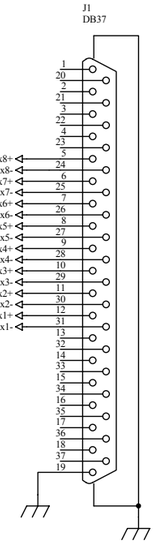

D89

ISSUE	BY	DATE
A	GMR	
1	AAT	06-06-00
2.1	AAT	05-09-00

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DISK:

TITLE: ML5000 SYSLINK II OUT

PAGE:

NO.: C4013 | ISSUE: 2.1 | SHEET 2 OF 1 | A3

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